MINING WORLD

AUGUST, 1950

VOL. 12 No. 9

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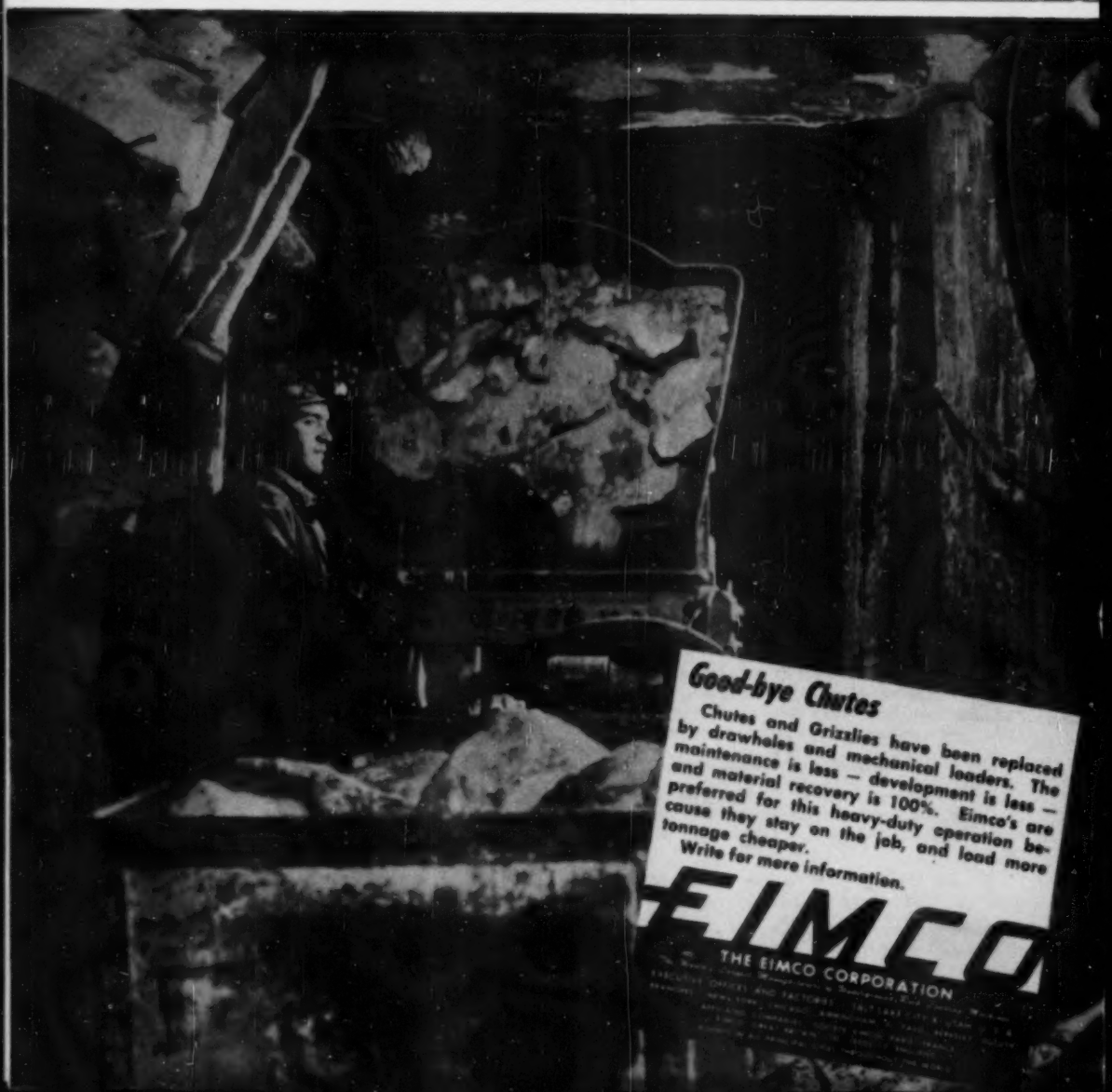

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Power shovels of the Piombo Construction Co., Inc., put steel pipe to work sealing a highway on the Black Point Cutoff, California

Tiger Brand Wire Rope is manufactured from raw ore to finished product under the strict quality controls of United States Steel. To help you get all the stamina engineered into American Tiger Brand, the services of a Field Specialist are available without charge.

Contact your Tiger Brand distributor or write Columbia Steel Company, Room 1422, Russ Bldg., San Francisco 4.

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UNITED STATES STEEL

PERFORMANCE ✓ OUTSTANDING

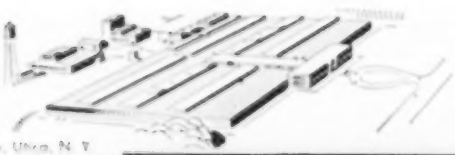
Here's a new sinker—the CP-59—that outperforms any other drill in its class (55 pounds). It has remarkably high drilling speed . . . exceptionally strong rotation . . . unsurpassed hole cleaning . . . excellent riding qualities.

Its design incorporates all the factors that make for fast, efficient, economical operation.

Low maintenance is assured by such features as a replaceable bronze chuck rotation nut to protect piston splines from scoring and a replaceable bronze cylinder bushing liner to make it easy to maintain piston alignment and full cushioning.

The CP-59 is equipped with a 4-in-1 backhead. Rapid and inexpensive changeovers make possible plain dry, blower dry, plain wet or air-wet operation.

Have your nearest CP dealer give you a demonstration of this outstanding drill, or write for a copy of SP-3089.



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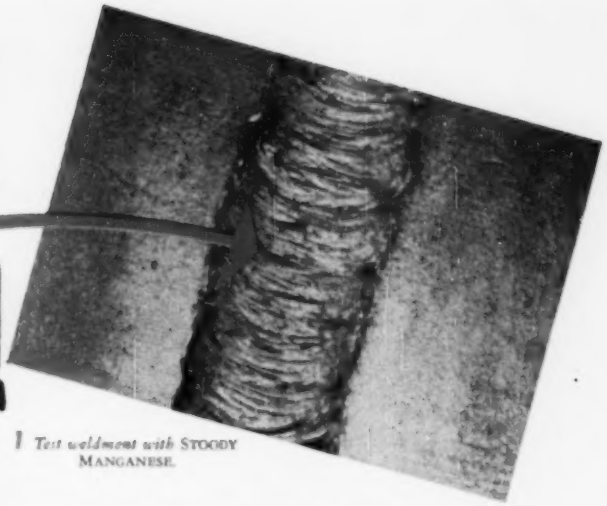
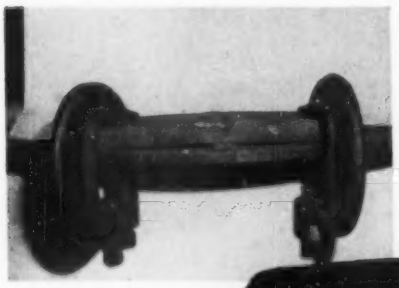
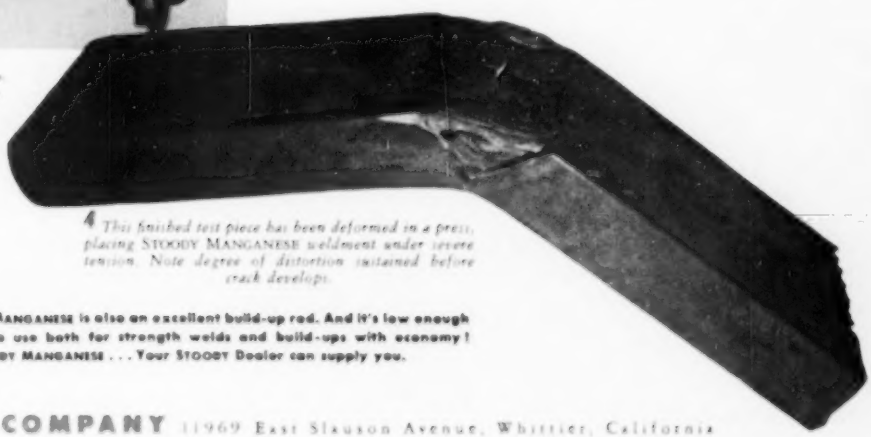


1 *Test weldment with* STOODY MANGANESE.

2 *Manganese plates beveled and ready to weld.*



3 *Warpage is counteracted with husky "C" clamps.*



4 *This finished test piece has been deformed in a press, placing* STOODY MANGANESE *weldment under severe tension. Note degree of distortion sustained before crack develops.*

A simple test that proves Superiority of STOODY MANGANESE!

Experienced welders fully recognize the "feel" of a good electrode . . . with the new STOODY MANGANESE it's a faster, snappier action, improved speed of deposit, good looking bead, and low spatter loss.

But if you want to SEE the superiority of STOODY MANGANESE . . . if you want to prove its exceptional resistance to cracking, try this simple test!

Bevel two ¾" manganese plates for vee-groove welding. Shim under the beveled edges to produce a slight reverse bow, such as would normally be allowed for contraction.

Now restrain the ends with husky "C" clamps and fill the vee with STOODY MANGANESE. Since the test pieces cannot move, the contraction strain is obviously placed on the weldment itself. NOTE THE COMPLETE ABSENCE OF CRACKS! Try this with any other bare manganese and compare results.

WHAT THE TEST PROVES: Absence of cracking indicates unusually high ductility, a quality in STOODY MANGANESE which insures extra strength . . . keeps welded parts WELDED where unusual shock and impact are encountered.

STOODY MANGANESE is also an excellent build-up rod. And it's low enough in cost to use both for strength welds and build-ups with economy! Try STOODY MANGANESE . . . Your STOODY Dealer can supply you.

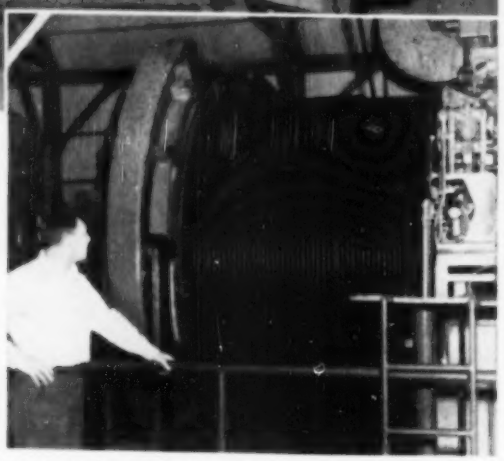
STOODY COMPANY 11969 East Slauson Avenue, Whittier, California

IF you happen to visit the Idaho-Maryland Mine at Grass Valley, Calif., you will see efficient, high-speed hoisting equipment rigged with Purple Strand Formset wire rope. Like other progressive gold miners, the operators of Idaho-Maryland are using Purple Strand because they can rely on it for the long service life that means *low cost per unit of work*, the true basis of comparison of wire-rope values.

Made of improved plow steel, the strongest, toughest grade of steel used in wire-rope manufacture, Purple Strand is built to take heavy punishment. It comes in a variety of constructions and in a wide range of sizes suitable for use on all types of shaft hoists, incline planes and scrapers.

Purple Strand is manufactured by Bethlehem Steel Company, an integrated steel organization that does the entire job from the mining of the iron ore to the spooling of the finished rope.

See your distributor for full information on Purple Strand. There is no better rope at any price.



8350 ft. of 1⅝ in. Purple Strand Formset hoist rope is used in the Idaho-Maryland gold mine at Grass Valley, Calif.

You are invited to attend Bethlehem Pacific's exhibit at the Metal Mining Show of American Mining Congress, Salt Lake City, August 28th to 31st.

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DRIFTS AND CROSSCUTS

Is It Later Than You Think?

Russia, operating with interior lines, has been able to improve greatly her mineral position and at the same time use satellite troops for actual combat. China and Korea are perfect examples of this policy.

Not pleasant is the fact that in 1949 China and Korea furnished 72 percent, or 5,560 short tons, of 60 percent WO, of the total tungsten imported by the United States. Less pleasant is the fact that domestic production in the same period was only 3,043 short tons.

For the first three months of 1950 United States production was 891 tons and imports from Korea were 1,029 tons. Nearly all the Korean production comes from the Sangdong mine, one of the principal tungsten and bismuth mines of the world, developed by the Japanese during the last war.

Tungsten from the Yellow Pine mine in Idaho has been credited with shortening the last war and saving countless American lives. Unfortunately, this tungsten orebody has been depleted.

The odds are all against finding another Yellow Pine tungsten orebody during the present crisis.

Exploration and development are necessary to locate new orebodies and extensions of known deposits.

The strongest type of immediate action is imperative to encourage exploration for, and conservation of, domestic mineral deposits by the American mining industry. Action of this type has long been advocated. The tragedy is that increased development of mineral resources was not started long ago.

Mine Closures Have Far-Reaching Effects

Leading spokesmen for the mining industry continually have called attention to the adverse effects of domestic mine closures. They have outlined the disaster to the economy of the mining district, the physical damages to the underground mine workings, the dispersion of the skilled mine labor, and of greatest importance the loss of vitally needed metals for national security.

In the Park City, Utah, district all major mines closed on June 30, 1949. Low zinc and lead prices made it impossible for the companies to continue operations in the face of greatly increased operating costs.

Mining engineers with a fair degree of accuracy can determine the tons of nonferrous metals lost through the shutdown. There is no problem in calculating the number of five-inch naval shell cases which could have been made using the lost copper and zinc production. The loss in lead production also could have been made into many army truck batteries.

However, the dispersment of skilled miners after a mine closes down has always been more difficult to record and evaluate.

A recent report of the Park City Employment Security office gives some interesting figures indicating what has happened to the 1,202 men who lost their jobs when the mines in this district closed last year. A total of 158, or 13 percent, have left the district. Wherrabouts of many of them is unknown. To date, 313, or 26 percent, are still unemployed of which, 63, or five percent, are drawing some kind of welfare in the district. The largest group, 399, or 33 percent, has found other than mining employment in the state. Only 332 men, or 28 percent, have been rehired by the mines in the district that have reopened.

The final story has not been told. Many skilled miners will never go back to work in the mines.

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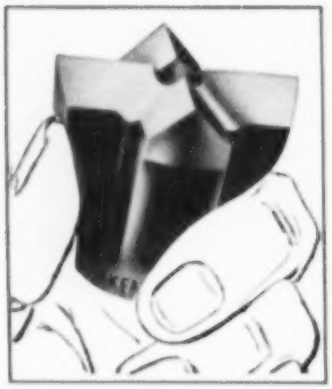
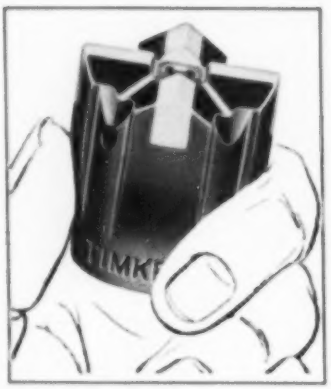
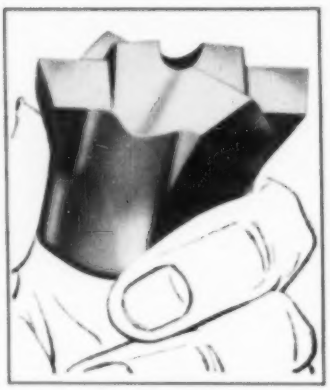


1. MULTI-USE Basic removable rock bit for 18 years. Gives lowest cost per foot of hole when full increments of drill steel can be drilled and when control and reconditioning of bits are correct. Low cost! Requires less policing than carbide insert bits.



2. CARBIDE INSERT For extremely hard and abrasive ground, small holes, extra deep holes. Gives you more drilling time —less time changing bits. Holes go down faster. Reconditioning is simplified. Offers many advantages which compensate for higher unit cost.



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and a complete Rock Bit Engineering Service!

WHICH bit is your best bet? Timken makes *all three* types—multi-use, carbide insert and one-use "Spiralock"—in a variety of series and sizes. And to help you choose the one bit that's best for your job, Timken offers a *complete* Rock Bit Engineering Service. Timken has been solving rock bit problems for over 17 years and our Rock Bit Engineering Service is qualified to help solve your problem. Whether you're looking for lower bit cost, lowest cost per foot of drilled hole, greatest possible drilling speed or any other advantage, our engineers, with *all three* types of rock bits to draw upon, can find the answer for you.

The Timken Rock Bit Engineering Service is at your disposal. For information and help, contact The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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FREE BOOKLET: *Everyone who buys rock bits should have a copy. Gives full information on all three types of Timken rock bits and the Timken Rock Bit Engineering Service. Shows full line of bits in actual-size photographs, with detailed descriptions. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".*

Uranium Miner—Still Needed

The April issue of MINING WORLD featured an editorial pointing out the need for an "experienced mining engineer well qualified by years of actual uranium mining and processing experience" to be appointed a member of the Atomic Energy Commission by the President.

Daily world-wide developments continue to emphasize the importance of increased uranium production and that a uranium miner is needed more than ever.

Unsung Heroes of the U. S. G. S.

Early press dispatches from the Korean fighting front indicated that most of the American civilians in South Korea had been accounted for with the exception of several United States Geological Survey geologists. It is hoped that when complete reports on civilian evacuation are available that all Survey personnel will have reached safety.

Tribute is past due to the members of the Survey for their outstanding services to the Nation in war and peace. There can be no question of the continuing readiness of the Survey to further the mineral position of the United States.

Diamonds From South Africa

The Premier HMS article appearing on page 30 has been under consideration since March when our South African Correspondent reported the new plant at the Premier mine had started operating.

After an exchange of letters and radiograms it was determined that another Correspondent should write the article and take or obtain adequate pictures of the plant and equipment.

The article was tentatively scheduled for the August issue and with Cullinan, Transvaal, Union of South Africa over 10,000 miles away a coordinated schedule had to be met to insure August publication.

On May 9th the correspondent reported as follows: "A happy note was struck with the staff on the job from the outset—they have placed all the facilities at my disposal —I have now been to the plant three times." On the 17th of June he reported that his original draft had been Airmailed. On the 21st of June the final approved article and the first pictures were Airmailed. On July 5th they arrived in San Francisco and production of the article was rushed for the August issue. Only one thing was now missing—"more pictures will follow."

Time was getting short to make the necessary engravings but it was known that the photographs would arrive in New York City by Pan American Airmail on a Monday. A quick check with New York City indicated that the pictures had arrived late Monday and were dispatched to San Francisco from the "Airmail field" on the 11th. The San Francisco Post Office was alerted for their arrival. The pictures were rushed through customs, the package was "Officially Sealed" by the Post Office Department and delivered on the 13th.

The last report from the Correspondent in commenting on the article reported: "On my return from the mine I was asked how mechanized it was. The most suitable reply I could find was the following—"I was standing near the crushers when one chute choked. Almost casually the foreman walked up to the control board and regarded it as if musing on which button to press. 'Take a chance' I said, 'press the blue one.' 'Don't be silly, man, do you want all the stuff to go back down the mine,' was his reply."

Sorry there are no diamonds included with this issue, but we hope you like it anyhow. G. O. A.

"OPERATION MARY ELLEN" . . .

featuring McCarthy Self-Propelled Horizontal Drills

● McCarthy Self-Propelled Horizontal Drills help reduce drilling and blasting costs at the Stanley Mining Company's Mary Ellen Iron Mine, near Biwabik, Minnesota.

Frank Bergstrom, Vice-president in charge of operations at Mary Ellen, says, "Only horizontal drilling methods are practical here, and our McCarthy Self-Propelled Units have given us excellent service. Total drilling and blasting costs average less than $0.05 per ton mined!

"Vertical drilling methods are not feasible at the Mary Ellen Mine due to the character of the banded taconite formation which is capped by five to fifteen feet of extremely hard, solid taconite. Below this, in the thirty-five foot bank being mined, there occur layers of altered material which are easily drilled by McCarthy Drills, and the entire bank is blasted upwards."

The McCarthy Drills average 240 to 320 feet per eight-hour shift. Fewer holes are required and less powder is needed to break the ore loose.

McCarthy Drilling Equipment has proved itself over and over again on tough jobs like this. Write today for full facts on the entire line of vertical, horizontal, self-propelled and public utility drilling machines. They're more powerful! They're faster, and they mean bigger profits for you!

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CANCELLATION OF RECIPROCAL MEXICAN TRADE TREATY SET FOR DECEMBER 31

The Administration seems to be waking up gradually to the fact that all is not sweetness and light in the Reciprocal Trade Treaty picture.

As has been pointed out several times, the desire to cut tariffs is stronger with our State Department than with foreign nations who naturally only want cuts when there is a one-way advantage. Even the State Department can lose patience eventually and the Mexican situation has become so intolerable that cancellation of the Mexican trade pact has been set for December 31, 1950.

Among others, domestic lead ore producers will benefit from the restoration of the tariff to 1.5 cents per pound from the current rate of 0.75 cent per pound. As the Mexican agreement is the basic treaty under the most-favored nation clause, all lead imports will receive the same tariff treatment when the treaty is abrogated. The tariff on lead metal, now 1.0625 cents per pound, will become 2.125 cents per pound. Molybdenum and fluorspar will be among the commodities also affected.

● Patterson Pulls Sneak Play

The action of the House of Representatives in voting a two-month extension of the suspension of the copper tariff shows what can be done in the line of a sneak play when Administration leaders are cooperating closely and really want legislation. The Patterson bill hearings were delayed so that the tariff or excise tax would have to be reimposed on June 30, and this bill was not the one considered by the House.

The way the deal was handled shows careful planning. Representative Patterson, no doubt, had been carrying the draft of a resolution in his pocket for days, watching with the collusion of the Speaker and Majority leader for the right opportunity to present it. After the President's message on Korea had been discussed at various times during the afternoon and routine business and the draft bill disposed of, the day's work appeared to be over. Most of the Congressmen were in the cloakrooms, or in the press rooms reading the ticker tape to keep up with the country's reactions. There were only 15 or 20 members on the Floor, and not a Westerner among them. This was the opportunity the Administration had been waiting for for days.

Pulling the draft out of his pocket, Patterson was recognized by the Speaker and presented what became House Joint Resolution 494. He made a short statement and secured passage of the resolution by the unanimous consent of the handful of Easterners who were on the Floor.

One would think from the Congressional Record (which in unanimous consent actions shows no counting of noses nor gives any indication of the number of members present) that the House went for the bill by acclamation. Nothing could be further from the truth.

The affair was so cleverly handled that the action was closed so as to prevent reconsideration of the vote when the advocates of the copper excise tax woke up to what had happened. The resolution extends the suspension to August 31, 1950.

Western Congressmen have introduced H. R. 671, H. R. 673, etc., to repeal action on H. J. R. 494, more as a matter of putting themselves on record against the action taken by the House on June 27 than having any real hope that it will pass.

Here was an important economic measure on which nine-tenths of the members of the House never had a chance to vote. It was a dirty deal for the West, but one must hand it to the Danaher lobby and Representative Patterson—they are clever. Now it is up to the Senate where watchdogs should be on the Floor at all times to prevent a similar play.

Cordon Bill Became Public Law 582

Providing for an extension of the time during which annual assessment work on mining claims held by location in the United States, including Alaska, may be made, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time during which labor may be performed or improvements made, under the provisions of section 2324 of the Revised Statutes of the United States, on any unpatented mining claim in the United States, including Alaska, for the period commencing July 1, 1949, is hereby extended until the hour of 12 o'clock meridian on the 1st day of October 1950: *Provided*, That assessment work or improvements required for the year ending at 12 o'clock meridian July 1, 1951, may be commenced immediately following 12 o'clock meridian July 1, 1950.

● President of Chile Reassured

It is nice to know that the President of Chile and the President of the United States are in such accord. As reported by Representative Patterson, author of a bill to continue to suspend the tariff on copper, "intimation was made at the presidential press conference that the President of Chile had discussed the matter with President Truman and had been assured of support for the continued suspension of the tax." The old diplomatic rule about non-interference with the internal affairs of other countries now appears to be quite obsolete.

● Where Is the Logic?

The Munitions Board announced about the middle of June that lead purchasing for the stockpile would be curtailed beginning July 1, but that zinc buying would continue at about the same rate as during last year.

Zinc appears to be in shorter supply than lead, and logic in yet still shorter supply.

● Can You Figure It Out?

The Copper and Copper Base Alloys Industry Advisory Committee of the Munitions Board met in June and, according to reports, "professed themselves as satisfied with the purchasing policy of the board in the past." A spokesman for the board, in return, told the committee that "the board will institute no purchasing policies which would endanger the capacity of the industry to supply copper in an emergency." You figure out for yourself the meaning of this curious bit of gobbledegook.

● Need for Self-Sufficiency

That the domestic copper industry should be sufficiently protected to be able to supply the maximum amount of industrial requirements is illustrated by the recent strike at the Anaconda mines in Chile.

According to one trade paper, "If the strike should prove to be another one of those prolonged affairs, it will of course have serious consequences in the United States."

It should be clear that the more we allow ourselves to depend upon foreign sources of minerals and metals, the more we lay ourselves open to pressure from foreign labor groups and foreign governments. A domestic premium price plan would be a cheap price to pay for independence.

"Caterpillar" team-play scores again

"Cat" D311 and D3400 Diesels power these Bucyrus-Erie churn drills in strip-mining operations near Ray, Arizona, for the Kennecott Copper Corporation of New York. They're as rugged as the mountains in the background.

"Cat" DW10 Tractor equipped with 'dozer cuts costs by high-speed shuttling between shovel area and dump for cleanup jobs and leveling.

TO BLAST and strip 4,000,000 yds. of overburden to establish an open-pit copper mine near Ray, Arizona, the Isbell Construction Co. uses a mechanized division of "Caterpillar" equipment to break through. The heart of the operation is a platoon of tough, reliable "Cat" Diesel Engines which power auxiliary equipment with minimum down time. By standardizing with "Caterpillar," they get speedy, one-dealer service on engines and machines alike when an occasional minor repair is needed.

Included in Isbell's assault forces are 22 pieces of "Caterpillar" equipment. The D311 and D3400 Engines are powering Bucyrus-Erie churn drills blasting holes to 1500 ft. to determine the depth of copper and character of deposits. A D13000 and a D9300 are used for miscellaneous compressed air jobs. Shovels are "Caterpillar" Diesel powered. D3400 and D4400 Electric Sets generate electrical power. "Cat" D8 Tractors tend overburden dump and make road. A "Cat" DW10 utilizes its speed to shuttle between shovel area and overburden dump for cleaning and leveling. The "Cat" No. 12 Motor Grader, with its highly maneuverable blade, smooths the way for everything.

"Caterpillar" earthmoving units are power-rated and precision-built to work as a balanced team. They get the job done faster and better and their big-muscled reliability eliminates operational headaches. Equally important, the world-famous "Caterpillar" service is available any time, any place. "Caterpillar" dealers are the shock troops of the organization; they know their job *down to the ground*.

CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.

Visit the "Caterpillar" exhibit at the Metal Show: Salt Lake City, August 28-31

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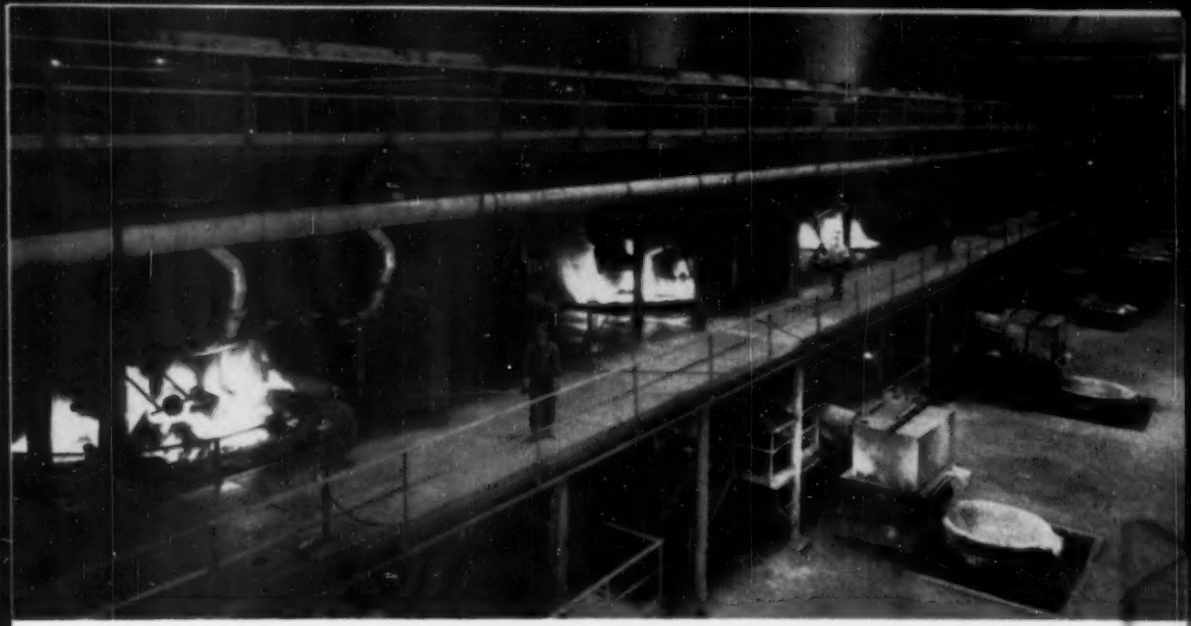


The heart of the ferromanganese plant with a melt under way in each of three furnaces. Anaconda's characteristic good housekeeping is evidenced by clean decks, guard rails, and orderly arrangement of slag trays and ladles.

FERROMANGANESE FROM ANACONDA

Rhodochrosite from ACM's Emma Mine is concentrated by soap flotation, calcined, nodulized and smelted to ferromanganese for steel plants

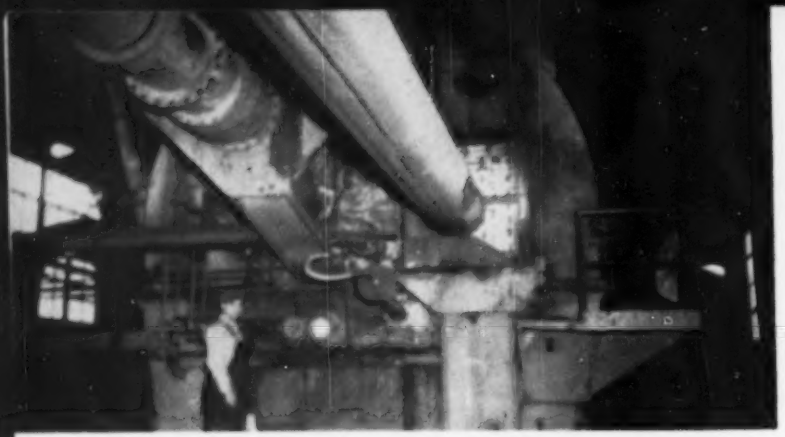
Steel—the backbone of America's industrial might — cannot be made without manganese. This report on the Anaconda Copper Mining Company's ferromanganese plant is particularly timely because of the interruption of Russian manganese shipments to the United States. Anaconda is the nation's largest manganese ore to ferromonganese producer. Russia is the only important steel producing nation that has a manganese self-sufficiency.—ED.

How the Anaconda Copper Mining Company makes ferromanganese at Anaconda, Montana, for the reduction of iron ore in the steel furnace makes an interesting story that began during the first World War at Great Falls, Montana. Pilot plant research was carried out at Anaconda and Great Falls on manganese ore—the beautifully colored pink rhodochrosite from the Emma mine at Butte, at that time the only producer of this type of ore in the United States. Today another mine, the Travona, in the famous old camp is also producing rhodochrosite. The pilot plant experiments proving successful, plant installation on a larger scale was begun at Anaconda where commercial quantities are being produced today.

Back of this story stand the men who oversee the operation. Chief among these is E. S. "Ed" McGlone, vice president in charge of Western operations whose headquarters are in Butte, about a 40-minute drive from Anaconda. At the plant in Anaconda are W. E. Mitchell, general manager; C. A. Lemmon, assistant general manager; E. A. Barnard, general superintendent, who make up the management and administrative personnel of the huge Anaconda concentrator, refinery, acid plant and auxiliary operations which include the ferromanganese plant. Directly in charge of the ferromanganese operation is John R. Moore, superintendent. Emil S. Kramlich is assistant superintendent. Marion C. Kenfield, Albert Jensen, and Leonard W. Olson are shift foremen.

Before going on with the story let

Left to right: John R. Moore, superintendent of the ferromanganese plant; William Chartier, foreman, and Emil S. Kramlich, assistant superintendent.



The huge rotary kiln where CO_2 is driven off the rhodochrosite flotation concentrate and high grade manganese nodules are formed. Note the boring bar on the right which removes material adhering to the walls of the kiln.

ing. Scrapers and tugger hoists are used in moving all broken ore except that in the rill stopes, which is withdrawn largely by gravity. About 1,200 to 1,400 tons of ore is produced daily.

Run of mine ore from Butte, containing 16.0 percent manganese, 1.0 percent lead, 2.0 percent zinc and 3.0 percent iron, is shipped to Anaconda where it is treated in the concentrator. The ore is stored in ore bins at the West Mill from which approximately 1,500 tons per day is withdrawn for milling. Sulphides are removed first, followed by collection of the rhodochrosite by soap flotation. The product from this operation is thickened and calcined in a 270-foot kiln. The resulting product forms the nodules used in producing ferromanganese as described in this article.

The product of the kiln is a fairly round, hard, black nodule. The greater

Manganese nodulizing plant at Anaconda, Montana. A train load of nodules on the way to the ferromanganese plant is shown in the picture.

us take a look at manganese ore and its steel-making derivative, ferromanganese, and see what part they play in producing steel for supplying the myriad items that go to make up the sinews, little and great, of our civilization.

Rhodochrosite, pink manganese ore, is hoisted through the Emma and Travona shafts. Averaging about 16.0 percent manganese, the veins of these two mines vary from three to 40 feet in width. Upwards of 2,000,000 tons of this grade of ore is blocked out.

Mined by timbered slot and flat-back cut-and-fill stoping, the length of stope between raise openings is usually 100 feet. Slot stoping is used in wider and soft sections of the vein where the ground is not self-support-

The Emma mine headframe and ore bins. This Butte mine has been the largest producer of rhodochrosite—the pink manganese ore—from which the ferromanganese is ultimately made.

percentage of the nodules vary from ¾ to 2 inches in size, and impurities are present in only minor amounts.

Ferromanganese is used as a scavenger in open hearth and Bessemer furnaces in the course of converting iron ore to steel. It is added to take up sulphur, phosphorus and oxygen and each ton of steel produced requires from 15 to 20 pounds of manganese to cleanse the molten iron of deleterious elements.

Flow Sheet Simple

The nodules come directly from the kiln in Anaconda and arrive at the ferromanganese plant in railroad gondolas. They are dumped over grizzlies to fall into a 100-ton bin. Other materials going into the electric smelter charge to form ferromanganese are: iron ore, coke, and limestone. These materials go into bins situated underneath the railroad tracks, thus permitting gravity flow to the mixing belt.

No elaborate flowsheet is in use at the ferromanganese plant. The materials making up the charge are dumped into bins that are 11 feet wide, 16 feet long and 8 feet deep. An eight-foot hopper bottom is built onto each bin to prevent the building up of a supply of dead-stored material that would accumulate in bins with square bottoms. The four materials going into the mixture providing the smelter charge are drawn out in varying percentages from the chutes in the bottoms of the bins by Hardinge size "C" feedometers, all four of which discharge onto the same belt to provide the mixed furnace charge. A series of short conveyor feed belts and a bucket elevator transfer the furnace feed to another belt that carries the feed directly to storage bins over each furnace. Fused ferromanganese is tapped from the furnaces into metal trays and the slag, of lower specific gravity, overflows into slag trays.

Electric Furnaces

The furnaces used to produce ferromanganese are reclaimed copper converters that otherwise would be rusting somewhere in a scrap heap. Each one is 19 feet 7 inches inside diameter and 9 feet 6 inches deep outside the brick lining, and have a capacity of 40 long tons of mixed charge.

The furnaces operate at 2,500 kw. and current flows from each electrode into the mixed charge at 75 delta volts or 35 ground volts—stepped down from 6,100 volts in the adjacent transformer room—and 20,000 amperes. The temperature of the electric arc thus produced approaches 6,600° F.

As the charge is reduced and the melt builds up an automatic hoist raises the electrode and keeps the resistance the same throughout the reduction cycle.

Power consumption is 3,000 kw. hours per long ton of ferromanganese produced and carbon electrode consumption 30 pounds per ton of ferromanganese.

Commercial Product

After the melt is complete it is tapped and flows at 3,300° F. to ferromanganese trays that hold four long tons. Excess slag flows from the trays to 15 long-ton capacity slag ladles which are carried to the slag dump and discharged. Trays and ladles are lined with eight inch fitted carbon blocks.

A 24-hour cooling period is allowed for the ferromanganese, the slag being removed from the trays after 16 hours. All slag and fine ferromanganese from the trays is crushed by a 12- by 24-inch shop-made Blake-type jaw crusher and returned to the slag bin for use as sterile slag, of importance in smelting because of its ability to cut down the conductivity of the melt.

Today the output of the ferromanganese plant is approximately 2,200 long tons monthly and about 540 tons per month is produced at Great Falls. Average per furnace month is about 550 tons.

Recoveries are high for a ferrous operation as 90.5 percent of the metal is saved with a 6.0 percent slag loss and a 3.5 percent vetalization loss. Slag ratio is 45:100 metal.

The finished product is sold at 60 percent plus-4-inches, minus-8-inches and the remaining 40 percent as near four inches as possible. An allowable percentage of 3.0 percent minus-¼-inch is permitted but nothing less than one inch is shipped.

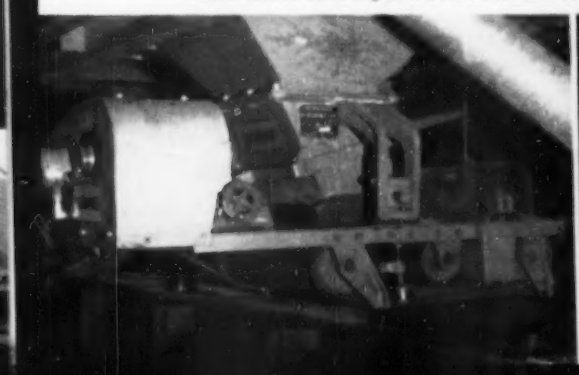
Sized product is loaded by hand onto skips and transferred directly to gondolas for shipment to United States Steel Corporation's Geneva, Utah, plant or other Western steel plants.

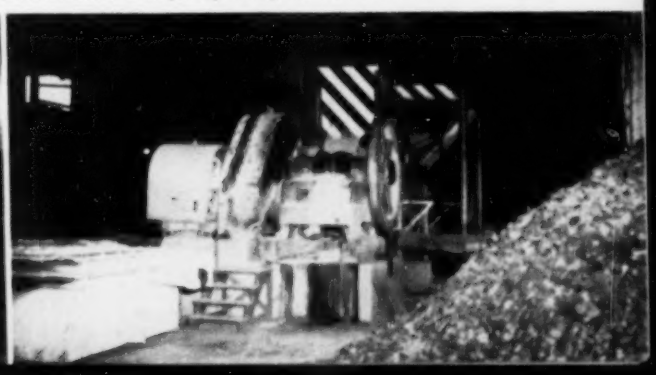
Left to right: William Chartier, foreman; Coleman Donahoe, foreman; and Al Beausoliel, craneman.

AVERAGE ANALYSIS ANACONDA FERROMANGANESE

Constituent	*Percent*
Manganese	80.0
Silicon	0.5
Carbon	7.0
Iron	11.5
Phosphorus	0.180
Sulphur	0.015

Left: One of the Hardinge Feedometers in action feeding onto the blending belt. This machine handles limerock. Right: Shop-made Blake-type jaw crusher used to reduce slag for reuse in the furnaces. Several hundred tons are piled up waiting return to the furnaces.





AMC's Western Division Invites Profit From the Program—

D. D. MOFFAT
Chairman of the Western Division

"The 1950 meeting of the Western Division of the American Mining Congress presents a very real educational opportunity to all persons interested in the mining industry.

"Whether your interest in mining lies in the field of business policy or in the day-to-day task of 'putting rock in the box,' an individual can help himself and the industry through active participation in the meeting."

E. H. SNYDER
Chairman, Salt Lake Exposition Committee

"The exhibits of mining equipment will be the largest and most diversified ever shown to the metal and nonmetallic mining industry by the leading machinery manufacturers.

"The exhibits themselves and the presence of technically trained men representing these manufacturers afford the greatest opportunity ever presented to study and compare the newest developments in machinery and supplies."

The Mid-Century Metal Mining Convention and Exposition, scheduled for Salt Lake City, August 28th through the 31st, promises to be one of the year's most outstanding mining meetings. Reports from the mining camps of the nation indicate unusual interest in the meeting and a large attendance of mining personalities is assured.

All general and operating sessions and the exhibits of many types of metal mining equipment and supplies will be held at the Utah State Fair Grounds, located at the western edge of Salt Lake City.

Two large meeting rooms at the Fair Grounds will permit the simultaneous holding of two separate program sessions. Therefore, attendees can pick and choose the session of greatest importance and interest to them.

A special added attraction will be the sessions of the Minerals Beneficiation Division of the American Institute of Mining and Metallurgical Engineers which will be held at the Hotel Utah on Friday, September 1st.

Preceding the opening day sessions will be the customary reception and cocktail party on Sunday, August 27th.

A full program of entertainment and events are planned for the ladies, and the evening parties have been arranged so that all may attend and have a good time.

Seven General Sessions

The First General Session, to be held at 10:30 a.m. on Monday, August 28th, will signal the opening of the Exposition. The theme for this session has significantly been set as *The State of the Industry*.

Simon D. Strauss, vice president, American Smelting and Refining Company, will present the "Outlook for the Nonferrous Metals and for Silver." Paul H. Hunt, vice president and general manager of the Park Utah Consolidated Mines Co., will present the "Trend of Metal Production, Wages and Prices."

One of the nation's leading mining statesmen, Honorable Clair Engle, member of Congress from California, will report on the "Problems of the Small Mine Operators."

The Second General Session, *Monetary Policy—Foreign Aid*, will follow the welcoming luncheon. Opening this session will be Jesse W. Tapp, vice president of the Bank of America, who will speak on "Sound Currency for a Sound Economy." Honorable Harry Cain, United States Senator from Washington, will talk on "The Future of Gold," and Joseph Stagg Lawrence, vice president of the Empire Trust Company will lead a discussion on gold. Keen interest of the industry centers on gold and everyone at the Exposition will find attendance at this session a "must."

"The Foreign Aid Program and Its Relation to the Mining Industry" by R. L. Wilcox, Chief of the Nonferrous Metals Branch, Industry Division, ECA, will be the concluding event of the session.

Tuesday's General Sessions

The Third General Session, *Strategic Metals—Stockpiling Tariffs*, will be held on Tuesday morning, August 29th. David D. Baker, Consulting Engineer, will report on "Domestic Supplies of Strategic Minerals." Carl Rolle, of the Office of Materials Resources, Munitions Board, will give an accounting of "Progress in Stockpiling for National Security." The stockpiling program will be reviewed by the Honorable Carl T. Durham, member of Congress from North Carolina, and Chairman of the House Arms Services Subcommittee on Stockpiling. The concluding speaker at the session, Paul B. Jessup, vice president of the Day Mines, Inc., will tell of the "Tariff Needs of the Mining Industry."

Safety—Labor Relations will be discussed in the Fourth General Session by Dan H. Harrington and Honorable Graham A. Barden, member of Congress from North Carolina and Chairman, House Committee on Education and Labor.

Public Lands and Atomic Energy

A morning and afternoon General Session will be held on Wednesday. The morning session will feature Government proposals for changing existing mining laws and will be given by Honorable G. Girard Davidson, Assistant Secretary of the Interior. The mining industry's viewpoint on the proposed changes will be presented by Charles F. Willis, Arizona Small Mine Operators Association; C. J. Parkinson, Salt Lake City attorney; and D. A. Callahan, Wallace, Idaho.

The Atomic Energy Sessions held the last two years at the annual meeting of the Colorado Mining Association have attracted such nation-wide attention that an "Atomic Energy" session has been considered of great importance at the Salt Lake Exposition. The Atomic Energy Commission has co-operated in planning this session, and Jesse C. Johnson, Manager, Raw Materials Operations, AEC, will speak on the Commission's "Uranium Procurement Policies and Plans." Frank H. MacPherson, Manager, Colorado Raw Materials Operations of the AEC, will discuss "Economics of Domestic Uranium Production." This speech should draw a record attendance, as many independent uranium producers have publicly charged that present uranium prices are out of line with production costs. The U.S.G.S. representative at the session will be Doris H. Blackman, who will describe "Prospecting for Carnotite Deposits."

WHAT THEY'RE EXHIBITING—

401-407—Allis-Chalmers Mfg. Co. (Tractor Division).

Exhibit will feature the mining applications of the A-C line of track type tractors in hard rock, 11,000 to 30,000 pounds.

411 & 417—Allis-Chalmers Manufacturing Co.

Feature of the exhibit will be an operating Hydrocone crusher. A Rotex Fly screen, a 5 by 4-inch rubber lined pump for handling tailings with solids of 325 mesh to 1/4 inch diameter, and a model of a 10 by 8-inch solids pump with automatic Texrope drive will also be in operation. Several motor cutaways, an oil breaker contactor and a starter will be displayed.

524 & 526—Allis Steel and Metals Co.

The New Model AB Pacific Shaftmaster Scraper will be on exhibit in the fol-

You to Attend the Exposition—Tour Utah's Most Modern Mines

ROY A. HARDY
Chairman of the National Program Committee

"This will be the first full-scale meeting of this type to be held in Salt Lake City since 1939. The convention will be for four days, Monday through Thursday, August 28-31. There will be an excellent program with nationally known speakers, also interesting papers and discussions covering subjects of major interest to the mining industry. Everything points to a fine meeting. Don't miss it."

PAUL H. HUNT
Chairman, Salt Lake Trips Committee

"An entertaining and instructive number of trips have been arranged. During the convention, two evenings are set aside for play: Monday at Bingham and Wednesday at Lagoon.

"Friday morning there will be aeroplane flights over the mining districts, in the afternoon a trip through the Geneva steel plant. Saturday morning a bus trip to copper smelters, mills, refinery and pit of the Kennecott Copper Corp."

The concluding paper of the session will outline the "Processing of Uranium Ores—Engineering and Metallurgical Aspects" and will be given by M. G. McGrath, Manager, Vitro Manufacturing Company.

Last General Session Thursday

The seventh and last General Session will feature *Taxation—Public Revelations*. William I. Powell, American Mining Congress, will speak on "The 1950 Revenue Bill." Public relations will be described by Charles M. Hackett, E. I. Du Pont de Nemours and Company, and James Hogle, Rico Argentine Mining Company.

Six Operating Sessions

The first operating session—*Mine Operating Problems*—will be held Monday afternoon. Ralph W. Neyman, Superintendent of the Hecla Mining Company, will describe "packaged Timber Handling." John G. Hall, General Foreman, Chief Consolidated Mining Company, will tell how the "Incentive System Increases Tons Mined Per Man Shift" and Percy S. Gardner, Jr., will outline a new system employing "Hydraulic Hoisting—A Unique Method of Moving Crushed Ore."

Milling—Operating Session

Milling Methods and Equipment will be the theme of this session, to be held Tuesday morning. "Operating Factors and Costs in Heavy-Media Separation" will be described by L. J. Ereck, Cleveland Cliffs Iron Company.

A panel discussion on "Rod Mill Liners" will be led by J. R. Clarkson, mill superintendent, Bradley Mining Company, and J. F. Myers, mill superintendent, Tennessee Copper Company. Angus C. Ensign, The Galigher Company, will summarize the "Application and Performance of New Holland Breakers."

"Golden Cycle's Modern Mill" will be described by Max W. Bowen, vice president and general manager, Golden Cycle Corporation, in the final paper of the session.

Third Operating Session

This session—*Exploration—Development of New Reserves*—should be of great importance because of the increasing needs for mineral exploration.

The first speaker will be Frank A. Ayer, vice president, Copper Range Company, who will speak on "White Pine—A Potential Major Copper Producer." A review of "Progress Towards Production at the Blackbird Cobalt Mine" will be given by Edwin B. Douglas, manager, Calera Mining Company. A symposium on Geochemical Prospecting will be held during the session.

The final paper by Homer Jensen, Aero Service Corp., and Leon T. Eliel, vice president, Fairchild Aerial Surveys, Inc., will summarize "How Aerial Photography and the Airborne Magnetometer Have Aided Extension of Ore Reserves."

Underground Production

The Fourth Operating Session will report on the *Progress in Underground Production* and will feature papers on "Roof Bolting in Metal Mines," "Truck Haulage Power Plants," "Trackless Mechanized Mining in the Lead Belt," and "Application of Oil Shale Mining Developments to the Mining Industry."

Drilling and Blasting

The Fifth Operating Session on Wednesday afternoon will begin with a paper on the "Problems of Underground Rock Breaking" by J. Fred Johnson, A. S. & R. Co. Don Healsip, Manager, Rock Drill Division, Canadian Ingersoll-Rand Co., will lead the discussion of the paper. Robert M. Simpson and C. W. Darby, Crucible Steel Company of America, will tell "How to Get more Footage Out of Hollow Drill Steel" and "An Overall Look at Rock Drill Bits" will be given by James D. Forrester. G. E. ap Roberts, Cate Equipment Company, will discuss the Forrester paper. The paper on "Progress in Blasting Procedures" by J. M. Ehrhorn, superintendent, U. S. Section of the U. S. and Lark Mines of the U. S. S. R. & M. Co., will be the last of the session.

Milling Reviewed Thursday

The final operating session on August 31st will review the *Advances in Milling Processes*. The first paper will outline "The Fluosolids Process" and will be given by T. B. Counselman, manager, Fluosolids Division of the Dorr Company, and S. R. Zimmerley, Chief, Metallurgical Division, U.S.B.M. "Plans for Treating Greater Butte Project Ores" will be reported by F. F. Frick, Metallurgical engineer, Anaconda Copper Mining Company. A. W. Fahrenwald, director, School of Mines, University of Idaho, will outline "Grinding with Centrifuged Media."

Annual Banquet

The annual banquet will be held in the Rainbow Ballroom on Thursday evening. Reservations for banquet tables (10 places each) can be made for $100. Following dinner there will be entertainment and dancing.

All interested in mining are urged to attend and your presence at the Exposition will insure additions to your "know how" in mineral production.

lowing sizes: 26 inch, 34 inch and 42 inch. The new Pacific Bit Knocker for knocking off any of the single pass bits will be displayed. Also on display will be Pacific Sheave Blocks, Pacific Sheave Anchors and various company made products for mine use. J. M. McKean will be in charge.

505—American Air Filter Co.

136—American Brake Shoe Co.
American Manganese Steel Division

On display will be a scale model, in wood, of a renewable lip type dipper. There also will be manganese steel shell liners and grates. There will be a complete display of hardfacing welding rods with a dipper tooth, a hammer mill hammer, track rollers, sprockets and idlers showing a hardfacing application.

122—American Brattice Cloth Corp.

The exhibit will feature ABC Brattice cloth and mine vent flexible tubing. There will be sample rolls of jute Brattice cloth for inspection and flame testing. The mine vent tubing will be attached to a blower

fan, which will be operated intermittently. The tubing will be suspended overhead on a rack and will demonstrate the demountable coupling as well as 90° elbows for going around corners.

616—American Wheelabrator & Equipment Corp.

The exhibit will feature an actual size cloth bag type Dustube collector with one wall of plexiglas to permit observation of its simple, rugged construction. New developments in filter cloths recommended for handling dusts and fumes at elevated temperatures, as well as filter tubes that have been in actual operation in the mining, smelting, and metallurgical fields will be available for examination.

316—Anaconda Wire & Cable Co.

Exhibit will consist of four panels, each one illustrating a different type of cable for use in various kinds of mining. Two important improvements will be shown, one being the use of cold rubber which adds greater life to the product, and the other a new type of shuttle car cable. A. W. Tracy will be in charge of the exhibit. Mr. C. B. Peck, assistant manager of industrial sales, will also be in attendance.

614—Albert & J. M. Anderson Mfg. Co.

On display will be Pow-R-Gard and Ground-Gard electric power distribution systems for mines and combinations of circuit breakers and power outlets in steel or aluminum enclosures.

911—Armco Drainage & Metal Products, Inc.

A Steelox Building will house the exhibit. The exhibit will include a shaft of steel tunnel liner plates, corrugated steel sheeting or lagging, quick-coupling air pipe, culvert pipe and PIPE-ARCHES for drainage, and FLEX-BEAM Guardrail.

114—Atlas Powder Co.

The latest developments in the original Rockmaster split-second delay blasting system will be shown. On display will be a new blasting galvanometer, adjustable to compensate for the gradual weakening of its silver chloride cell, thus insuring accuracy. A new plastic insulation for all electrical wiring on blasting caps will also be featured.

110—Barber-Greene Co.

The principal feature of the display will be a special three dimension rear projection booth, upon the screen of which will be shown a series of stereoscopic color slides showing Barber-Greene equipment as applied to the mining industry. These will include several of what are believed to be the first color stereo photographs ever to be taken underground in a mine.

314—Bethlehem Pacific Coast Steel Corp.

The exhibit will feature Bethlehem Pacific steelmaking and fabricating facilities. This will be supplemented with moving slides showing wire rope and drill steel in use in various mining operations. A guessing contest with a valuable prize for the winner also will be an attraction.

611-613—Bucyrus-Erie Co.

A photographic display picturing Bucyrus-Erie products will be featured. Emory M. Heatton will be in charge.

704—The Buda Co.

At the exhibit will be three Diesel haulage engines. The models are: 6DAS-1125, used largely for powering 22 and 30-ton trucks; 6DAS-844 Diesel truck engine, used largely to power smaller sizes of off-highway trucks, and a 6DA-844 Diesel

"The increased size of this year's Metal Mining Exposition at Salt Lake City indicates that the manufacturers are doing their best to bring to the mining industry the latest developments and methods for the reduction of mining costs. In this country, the close association of mining operators and mining machinery manufacturers is a significant factor in the technological advancements which have distinguished our industry."

H. L. McCormack,
Chairman, Manufacturers Division.

engine. This is a new model which will be "exploded" to show the new Dyna-Swirl combustion chamber.

148—Buell Engineering Co.

332—E. D. Bullard Co.

The new line of Bullard "Hardboiled" hats will be displayed, with samples of the seven new standard colors featured by the line. Also on exhibit will be the company's new metal hats. Other items will include the Morenci mine belts, first-aid and respiratory equipment.

605—The C. S. Card Iron Works Co.

On exhibit will be a standard 40 cubic foot rocker dump type ore car, representative of the complete line of this type of car now available. Also on display will be a standard Z-20 ore car together with a rail turnout and switch stand. There will be a table display of rope sheaves and rollers.

245—Caterpillar Tractor Co.

The outside exhibit will include a Caterpillar Diesel DW10 Wheel-type Tractor with Athey PD10Q Wagon, a D7 track-type Tractor with Hyster Hystaway, a D4 track-type Tractor with HT4 Traxcavator, an Electric Set (new, large V-type), and a D311 Cutaway Engine. W. H. Hogan will be in charge.

723—Chicago Pneumatic Tool Co.

The new Model G-600 Drill Jumbo will be the featured exhibit. This rail-mounted twin boom unit has been designed for use in mine headings up to 10 by 12 feet. A complete line of sinker drills, demolition tools, drifters, diamond drills, stopers, and the CP-8 gas-driven core drill complete the drilling equipment displayed. Pneumatic tools for mine use, equipment maintenance, and shaft timbering will also be displayed or their application demonstrated.

708—Christensen Diamond Products Co.

Various diamond bits, a surface drill, an underground drill, a circulating pump and associated supplies will be exhibited. The diamond bits on display will illustrate the variety of sizes and types available to the mining industry. They will be core bits, casing bits, casing shoes, pilot bits and concave bits. There also will be reaming shells of both the insert and balanced type. W. J. Harris will be in charge.

700—The Colorado Fuel and Iron Corp.

The central theme of the exhibit will be grinding media surrounded by samples of CF&I's Industrial Screen, Wickwire Rope, and Mine Roof Support Bolts. A miniature panel will visually present the advantages of the Mine Roof Support Bolts. Samples of Wickwire Rope, specifically designed for use in the mining industry, will be shown on a display board. The major presentation will be a section of a ball mill in operation with full visibility for the spectator. Operating patterns formed by the Grinding Media and pulp at speeds from zero to critical speed will be clearly discernible. Harmon H. Davis will be in charge.

Colorado Iron Works Co.

On display will be a working model of the new Weinig concentrator, capable of making separations in the size ranges below ¼ inch, where other gravity processes are unsatisfactory. Exhibit will also feature improved features of the Akins classifier.

615—Crucible Steel Co. of America.

With the development of Alloy hollow drill steel, company sales representatives and metallurgists will be on hand to discuss varying applications of the product. A. E. Perkins will be in charge.

149—Cummins Engine Co., Inc.

Three activated cutaway Cummins Diesels will be featured in the exhibit. These engines will include the new 150 hp. Model JS-600, the 300 hp. Model NHRS-600, and the 550 hp. Model NVHS-1200. Each of the cutaways has been sectionalized to show the internal structure and operation of the engines, including the exclusive Cummins fuel system and the new DD (double-disc) type fuel pump. All portions of the engines that have been sectionalized have been replaced with lucite, and the engines are internally lighted and activated.

210—Dart Truck Co.

Exhibit will feature the latest in Torque converters for heavy mining trucks, together with a display of the company's heavy-duty off-highway unit.

815—Denver Equipment Co.

The exhibit will feature a 4-cell No. 8 Denver "Sub-A" flotation machine concentrating a lead ore. Included in this small flotation circuit will be a Denver agitator-conditioner, a Denver wet reagent feeder and a Denver sand pump, operating in a closed circuit. Henry J. Gisler will be in charge.

213-215—E. I. du Pont de Nemours & Co.

The exhibit will feature the use of Du Pont "MS" Delay Electric Blasting Caps in underground mining and recommendations covering equipment and its installation for improving the safety of electric blasting in underground operations. R. H. Summer will be in charge.

207 & 211—Thomas A. Edison, Inc.
Storage Battery Division

The exhibit will include batteries for both industrial trucks and mine locomotives. Feature of the exhibit will be a 35-cell C6 nickel-iron-alkaline storage battery widely used for powering trammer locomotives and a 50-cell C8 battery which is typical of those available for powering industrial trucks in smelters and refineries. Complementary exhibits will include cutaway cells and an animated cell design to show internal construction. R. H. Weeks, Jr., will be in charge.

505-511-404-410—The Eimco Corp.

On display will be the newest type "Rocker Shovel" loading equipment for underground and surface operation. Underground models will be shown with either air or electric motors and surface models in either gasoline, diesel or electric types. In addition to loading equipment Eimco will display models of its continuous vacuum filtration equipment for metallurgical plants and the Eimco Folding

Scraper for efficient loading from scram drifts and other scraping applications. D. W. Saunders will be in charge.

525—The Electric Storage Battery Co.

Various sizes of Exide-Ironclad batteries and cutaway cells that are used in mining service will be featured. In addition, a contest will be conducted with a savings bond as a prize, based on the number of times a specially-built 4-cell Ironclad battery in a lucite container can lift itself by means of a device known as the "Dyna-lift." C. J. Moore will be in charge.

156—Elreco Corp.

901—Euclid Road Machinery Co.

The new 10-ton Model UD rear-dump Euclid will be the feature of the display. In addition the exhibit will feature job photographs of other Euclid equipment prominent in the mining field, as well as catalog literature on current production Euclid equipment. A. S. McClimon will be in charge.

608—Flexible Steel Lacing Co.

356—The Galigher Co.

The exhibit will consist of actual working displays of commercial models featuring the Agitair flotation machine, Geary-Jennings Samplers and various phases of ore dressing laboratory equipment. These machines will be operated continuously during the show hours and a metallurgical engineer will be in attendance. Separate displays will show the functioning of parts that are not readily visible in the actual working commercial unit.

219-225-229-251—Gardner-Denver Co.

The exhibit will include the following products: Stopers RB104 and RB94; 3-inch and 3½-inch Pneumatic Columns; Sinker Drills—S17U, S35D, S48P, S55D and S73W; Drifting Drills—CF99, CM93, S48D and Air Feed Leg; Hydraulic Drill Jumbo with SF73, CF79, and CF93 Drills; Hoists—HBA, HKK, HM, HMS; Air-slushers—HEE and HME; Drill Steel Sharpener and Hole Punches; Pneumatic Sump Pump; Air Motors—MA3, MKG, MEGS and MEA; 3-inch Type G Double Suction Centrifugal Pump; Model WBH Air Compressor & Tank Mounted Compressor Unit; GD14 Mine Car Loader; Deep Hole Drilling Equip. and demonstration of effect of "Satinizing" of rock drill parts. F. B. Matheson will be in charge.

515—General Electric Co.

A 11½-ton storage-battery trammer locomotive will be the feature attraction on exhibit. Visitors will be able to operate this baby locomotive which is only six feet long and has an over-all height of 38 inches. Also exhibited will be an operating transparent plastic, 10-hp., Tri-Clad pump motor. Other equipment which will be shown includes: a G-E two-shoe magnetic d-c brake, a G-E flotation motor, a high-voltage air-break contactor such as used on large motors for voltages between 2300 and 4800, and a motor-generator battery charging set of the type used with the trammer.

414—General Motors Corp.
(Detroit Diesel Division)

339—Goodman Manufacturing Co., Mancha Div.

Mancha's "Little Trammer" will be displayed in the Mancha exhibit. A new Mancha attachment which adds to safety in its operation will be on demonstration.

801—Gould Storage Battery Corp.

Exhibited for the first time to the metal mining industry, is a new line of "Z" Plate batteries. As a result of new progressive casting techniques the positive grid—the key to battery life—is 66 percent more resistant to deterioration and grid porosity has been reduced 85 percent.

712—Hardinge Co., Inc.

The exhibit will feature a movie of its new Tricone Mill in operation at Tennessee Copper Company. In addition to the film showing the new Hardinge Tricone Mill fabrication and operation, a film showing operation of the Hardinge Counter-Current Heavy-Media Separators on the Mesabi Iron Range may also be shown. G. A. Wallerstedt will be in charge.

515—Harnischfeger Corp.

Exhibit will display features of the P&H line of shovels, incorporating the "Magnetorque" electro-magnetic type clutch.

115-214—Hercules Motors Corp.

100—Hercules Powder Co.

The exhibit will feature industrial explosives and blasting supplies.

801-805-809—Hewitt-Robins, Inc.

The display will feature operating units, including a heavy-duty scalper weighing less than six tons, able to scalp off huge rock lumps weighing 9,000 pounds or more, each at the rate of 1,100 tons or more per hour. The second unit will be a condensed version of an extra-heavy-duty Mine Conveyor—the first to operate successfully in underground copper-ore transportation. Also on display will be hose and belting products, idlers and screen cloth.

101—The Humphreys Investment Co.

The exhibit will be a full size Humphreys Spiral Concentrator in operation as a closed circuit test unit. The spiral is the Model 24-A 5-turn spiral which is in use in operating plants treating many different types of minerals. The largest present operation handles approximately 7,500 tons of feed daily.

252—Independent Pneumatic Tool Co.

Four completely new Thor pneumatic mine tools among the company's full line of drilling equipment will be exhibited. The new Thor power-feed unit for drifter rock drills, with lightweight aluminum shells in three lengths up to 96-inch feeding capacity, and featuring extra sensitive control that practically eliminates cathide top drill steel breakage, is the newest development to be shown by the company. Other new models include the Thor reverse feed unit for stoper rock drills; Thor stoper legs for converting sinker-type drills into stopers, and a new, lightweight Thor 35-pound class sinker rock drill.

705-709-715-715-804-808-812-814—Ingersoll-Rand Co.

This exhibit will emphasize the large variety of products that Ingersoll-Rand builds for the metal mining industry. On display for the first time will be a large number of new products of all types. These include new rock drills, new Carset jackbits, new and lighter drill mountings, and the improved JL-4 jackleg for mounting jackhammers. Another feature will be the new Type XLE, two-stage, package type stationary compressor, which is built in sizes from 125 to 350 hp. for pressures up to 125 psi. An innovation this year will be the display of a large, multi-stage, high-pressure, centrifugal pump and several smaller pumps for general and shaft sinking applications.

415-415-419-425-425—Jeffrey Manufacturing Co.

On exhibit will be two MV Mechanical Vibrating Conveyors set up for continuous operation with one No. 4 Electric Vibrating Pan Feeder; one Impact Crusher (The Rock Buster); one Electric Vibrating Barrel Packer (in operation); one A-6 Post Drill; one Type 12-A AERODYNE mine Fan; one 4-foot AERODYNE Junior mine Fan; one Universal Blower; one AERODYNE Midget Blower; one 8-foot section Underground Belt Conveyor; and Belt Idlers, Chains and Transmission Machinery. J. H. Fulford will be in charge.

529-533-428-432—Joy Manufacturing Co.

The latest developments in machinery for mechanized mining will be exhibited.

A special trip is planned to visit the Oil Shale Demonstration Mine at Rifle, Colorado. Special Pullman cars will leave Salt Lake City at 5:30 P. M. Friday, September 1, via Denver & Rio Grande Western Railway. After visiting the mine and plant on Saturday, visitors can either return to Salt Lake City or go on to Denver by train Saturday evening.

New machines to be featured are the Joy 15-HR continuous-type loader, the Joy drillmobile, a self-propelled, rubber-tired drilling unit; the new S-91 stoper with telescopic feed leg, and two new portable hoists. Other equipment will include Joy's complete line of rock drills, slushers, portable hoists, core drills, fans, air compressors, rock bits, core bits, electrical connectors, and scraper buckets.

509—Kennametal, Inc.

500—Le Roi Co.
Cleveland Rock Drill Division

The exhibit will be a full line of mining machinery, such as the fully air-powered Cleveland MDR mine jumbo. This jumbo will be equipped with the popular 3½-inch diameter PD25 power-feed drifter. The new 2-to-1 patented air-feed light wagon drill will be shown. Along with the new unit a complete line of rock drills, drifters, stopers and reverse air feed sinker drills mounted to air columns will be shown. An added feature will be the Le Roi Cleveland S115 stoper.

134—A. Leschen & Sons Rope Co.

A visit to the exhibit will enable anyone interested in wire rope using equipment to examine samples of "HERCULES" (Red-Strand) Wire Rope in the constructions generally employed on various types of mining equipment. There also will be a display of Wire Rope Slings for material handling, including "HERCULES" Flat-Laced Slings.

619—Lima-Hamilton Corp.

The exhibit will have a background display, including several photographs of LIMA shovels, cranes and draglines used in the metal mining industry. The enlarged pictures will be in natural colors.

20—Linde Air Products Co.

222—Link-Belt Co.

228—Link-Belt Speeder Corp.

126—The Ludlow-Saylor Wire Co.

A wide variety of actual samples of Super-Loy woven wire screens and wire cloths will be displayed. Also included will be samples of special hook-strip edgings for applying wire cloths to tensioned vibrator screens. Visitors can see the variety of metals and alloys in which wire cloths and screens can be supplied—in the improved Sta-Smooth Even-Surface Square-Opening Screens—in Arch-Crimp, Sta-Tru and Sta-Clear Long Slot Woven Wire Screens. R. R. Peterson will be in charge.

501 & 900—Mack International Motor Truck Corp.

Feature of the exhibit will be the giant Mack Model LRSW 30-ton, 6-wheel, off-highway dump truck. Powered by a Cummins NHRBS 300-horsepower diesel engine, this vehicle also incorporates a Schneider torque converter. Because of its size, the Mack LRSW will be exhibited outside the main hall. The balance of Mack's exhibit will display Mack's famed balanced bogie and the revolutionary power divider. In addition, Mack will show its Model TRDX-510, 8-speed duplex transmission. Petrie I. Fleming and John Walker will be in charge.

125—Marion Power Shovel Co.

The exhibit will feature a working, built-to-scale miniature model of the Marion Type 7400 walking dragline. The model, built to a scale of approximately 1 inch to 1 foot, required some 3,000 parts and 6,900 man-hours to design and construct. The model is put through its operating paces by means of a control board located about 20 feet from the machine. Through these controls, which include 16 electric connections, the model can do everything its "big brother" can. Robert J. Lick will be in charge.

201—Mine Safety Appliances Co.

The exhibit will feature the Edison R-4 electric cap lamp, which develops 25 percent more light than any previous cap lamp; the MSA Maskfone, which allows clear communication between mask wearers over a sound-powered circuit, and the MSA Chemox oxygen breathing apparatus, which now has a standard equipment, the MSA Cleartone speaking diaphragm. MSA velocity power tools, Skullguard safety hats and a complete line of respirators, first-aid equipment, gas masks and oxygen breathing equipment also will be displayed.

128—The Mine and Smelter Supply Co.

The exhibit will be a "Massco Circuitron" used as an automatic grinding circuit control. This electronic instrument automatically maintains any grinding circuit at its optimum point by controlling the rate of new feed to the grinding mill, regulating the classifier sand load and maintaining a constant density of the classifier overflow.

508—Mining World and World Mining

On display will be samples of field work done by its personnel in the process of travel throughout the mining areas of the United States. In addition there will be a display of similar work done in the international mining field. Max Holsinger will be in charge.

718—Morris Machine Works

510-512—Morse Bros. Machinery Co.

Exhibit will feature the well known Morse line of metallurgical equipment, including the Trueline rake classifier, the "Ferair" flotation machine, feeders and other milling items.

714—Mosebach Electric & Supply Co.

500—National Electric Coil Co.

422—National Malleable & Steel Castings Co.

In addition to displaying the well known Willison automatic couplers, for all types and sizes of mine and industrial cars, the exhibit will feature two new specialties, the National NC-1 truck for mine and industrial equipment, and National rubber cushioned draft gears. Adaptable for high-speed mine cars, the National NC-1 truck is essentially a scaled-down version of the National C-1 truck which was originally developed for the railroads and which is built to A.A.R. specifications. Advantages listed for the NC-1 truck are that it reduces impact on the road bed and decreases car spillage because of exceptional riding qualities. Herb H. Smith will be in charge.

118—Nordberg Manufacturing Co.

A working model of a Symons cone crusher and photomurals picturing installations of Nordberg machinery for processing ores will be exhibited. Nordberg's booth is designed to give guests a place to relax and discuss operating problems with company representatives.

334—Ohio Brass Co.

Equipment on display will include the new and popular O-B roof support expansion shell and plug, as well as representative safety and control materials, trolley fittings, rail bonds and collection equipment. J. H. Sanford will be in charge.

328 & 330—Western Cartridge Co., Division of Olin Industries, Inc.

The exhibit will show blasting caps of all kinds manufactured by Western Cartridge Company, and dynamites manufactured by Columbia Powder Company and Equitable Powder Company. A products institutional theme will be depicted by means of a centrally located turntable on which are mounted five display units featuring the products manufactured by the various Olin divisions, subsidiaries and affiliates. A. J. Barocca will be in charge.

817—The Osgood Co.

Large photographs and literature will be displayed. The literature will be on the modern Osgood and General lines, consisting of power excavators and material handlers from ⅜ cubic yards to 2½ cubic yards capacity, mounted on crawlers, trucks, or as self-propelled pneumatic-tired Mobilcranes.

617—Osmose Wood Preserving Co. of America

Samples of Osmose timber preservatives used by the mining industry will be on display. Specimens of osmos-treated mine timbers after many years of service will be shown. Photographs, technical files, complete cost data and plant models will be available. The feature will be the Osmose wooden mine roof plug. Dan Kamphausen will be in charge.

701—Ottumwa Iron Works

701—Pittsburgh Gear Co.

130—Raybestos-Manhattan, Inc.

719—Rock Bit Sales & Service Co.

The following products are to be displayed: Crown Carbide Rok-Bits, Intraset drill steel, and Carbide drills for use with electric or air-operated percussion hammers. New products to be introduced in August are the Hole-Saver, which is a tool to retrieve broken steel and lost bits; Knock-Off Blocks, an air-operated tool for removing one-use bits from steel; and a Gauge, used for checking angle of carbides when regrinding bits. John Neamand will be in charge.

906—John A. Roebling's Sons Co.

A display of electrical wire and cable will include portable power and mining machine cables; bare copper, trolley contact and magnet wire. Wire rope for mining applications also will be shown, as well as sizing and vibrator screens and metallic filter cloth. Eugene M. Urban will be in charge.

917—Sandvik Steel, Inc.

504—Sheffield Steel Corp.

237—Simplicity Engineering Co.

An operating screen will be used to display the efficiency of the unit. It will be a 4 by 14 foot two-deck horizontal-type screen used for close sizing of finer sizes, and for dewatering of fine materials.

821—Socony-Vacuum Oil Co., Inc.

625—Southwestern Engineering Co.

The exhibit will feature an 18-inch working laboratory model of the Sweco separator, featuring a vibrating screen

The great open pit operations of Kennecott's Utah Copper mine at Bingham will be visited on Saturday, September 2. Busses will leave at 8:00 A. M. and return to Salt Lake City about 1:00 P. M. after visiting the Garfield smelter (AS&RCo.), Magna and Arthur mills, Kennecott's new electrolytic copper refinery and the open pit mine.

with a compound gyratory motion whereby every point of the screen is simultaneously vibrated in horizontal, radial and tangential planes. Literature and photographs, etc., will be available on the Sweco factory-built HMS plants. (Process licensed by American Cyanamid Company.)

818—Stearns-Roger Mfg. Co.

Exhibit will feature the company's design, engineering and construction services.

716—W. O. & M. W. Talcott, Inc.

The display will include the complete line of belt fasteners for rubber conveyor and transmission belting. A feature will be the Talcott Acme patch fasteners for repairing damaged or ripped belting.

124—The Tamping Bag Co.

The feature exhibit will be seal-tight Tamping Bags made from wet strength paper which deteriorates very slowly in a high humidity atmosphere. A wide assortment of sizes will be on display. The other item on display will be the new weed and brush killer.

235—Timken Roller Bearing Co.

The exhibit will be built around the company's three types of removable rock bits: multi-use bit, the carbide insert bit and the new spiralock bit. The display will have a background built to carry a message for each type of bit on 11 plastic signs. In addition generous quantities of samples of the various types of rock bits will be shown. A representative quantity of Timken bearings and samples of Timken steel and seamless steel tubing will be shown.

132—Tool Steel Gear and Pinion Co.

A brand new exhibit panel will be built up to display parts of all descriptions for mining machinery made by the company. Cut-away and etched-away samples of various parts, showing the depth and hardness of the wearing surface case and the tough ductility of the supporting core, will be featured.

612—Traylor Engineering Corp.

601—Traylor Engineering and Manufacturing Co.

The exhibit will feature large blowups of the crushers, feeders, crushing mills and smelting machinery manufactured by the company. A projector will be used to show many types of Traylor equipment in the field, as well as its many outstanding design features. C. Hayward Roberts and A. C. Mast, Jr., will be in charge.

604—The W. S. Tyler Co.

The main feature of the exhibit will be an operating Ty-Rock screen, such as is used throughout the world in the metal mining industry. Samples of woven-wire screens of many different metals and meshes, along with a Ro-Tap testing sieve shaker and Tyler standard screen scale testing sieves will also be exhibited.

722—Ultra Violet Products, Inc.

The "Mineralight" ultra-violet lamps will be featured. The new short-wave SL Mineralight will be demonstrated, as well as the new long-wave ultra-violet lamp. On display and for demonstration will be an assortment of portable Geiger counters. In addition there will be a very large, colorful and interesting display of mineral specimens.

518—U. S. Steel & Subsidiaries

Products featured will be Low Alloy-High Strength Steels, plate liners for grinding mills, aerial tramways, electrical wire and cable and wire rope. Request cards will be available on all products, with requests for information, services and literature be serviced at the booth. Robert G. Hill will be in charge.

518—Universal Atlas Cement Co.

106—Victaulic Co. of America

Victaulic pipe couplings, sizes ¾ through 60 inches in diameter; modern Full-Flow elbows, tees, reducers and accessories for compressed air, water supply, drainage, and mill pipe systems, and handy Vic Groover portable pipe tools will be on display. Units operating under air and water pressure will be shown. A new, simplified Victaulic header, complete with plug valves for hose take-offs, will be featured. R. W. English will be in charge.

428 & 437—Western Machinery Co.

The display will consist of: a Wemco SH classifier of commercial size, arranged in operating position and wired so that the booth visitor may operate the triple-pitch spiral and hydraulic lifting device. A commercial size Fagergren flotation machine with special cut-away mechanism to illustrate the mechanical design of the cell. A Fagergren laboratory flotation cell will be in operation to illustrate the agitation-dispersion principle of the Fagergren mechanism. A plastic model Heavy-Media Separation unit will be in operation to illustrate the separation principle of the Heavy-Media process. A Wemco centrifugal sand pump will be displayed, with rubber-lined wearing parts. R. W. Hernlund will be in charge.

521—Western Rock Bit Manufacturing Co.

The exhibit will display all types of the Liddicoat bit. There will be demonstrations going on at all times as to attachment and detachment for drilling purposes, along with charts and graphs and case history studies showing the cost saving involved in those mining companies now using the Liddicoat bit. In addition, there will be attractive literature explaining the purpose and the economy of the Liddicoat bit.

105-111-204-210—Westinghouse Electric Corp.

Electrical equipment of interest to mining, milling, smelting and refining companies, as well as mining machinery manufacturers, will be exhibited. A special feature of the display will be a graphic presentation of the application of Type AB De-ion circuit breakers to open-pit and underground distribution systems, to provide ground-fault and short-circuit protection — giving maximum protection to personnel and equipment. The display will also include: New A.C. and D.C. Life-Line motors, New Life-Linestarters, New type control center and Westinghouse Type BP tapet-hardened steel for applications requiring strength and toughness.

609—Willson Products, Inc.

A complete line of eye and respiratory protective devices for the individual worker will be displayed. S. C. Herbine will be in charge.

129 & 135—Worthington Pump & Machinery Corp.

Featured in the 720 square feet of exhibit space will be the complete line of Blue Brute drifters and stopers. Blue Brute hand-held rock drills and air tools, a UMW-40 wagon drill, and representative models from the line of Blue Brute portable self-priming centrifugal pumps will be on display. Worthington Mult-V drives, a Unabloc vertical air compressor, and a representative Monobloc pump will be shown. Slides and photographs will illustrate the corporation's air conditioning and refrigeration equipment, steam turbines, electric motors, diesel engines, stationary compressors, as well as larger products used by the mining industry. P. H. Nast will be in charge.

"We Get More Rock Per Round And Per Pound With The New ROCKMASTER "16" Blasting System!"

FROM drift and tunnel comes the word: "ROCKMASTER "16" *gives as much as 30% more footage per round!*" And many mine foremen claim that they accomplish this with less powder. Naturally, this adds up to more carloads of material per round and per pound.

There's more to the ROCKMASTER "16" story! *Sixteen* periods—a wide choice of short or long milli-second delays—give better control over throw, back-break, and material size. *Sixteen* delay periods fire within 550 milli-seconds!—there is less strain on timbers and roof . . . less dust and a quicker return to the face.

Underground and on the surface—in mines, pits, quarries, and construction jobs—you hear the same story: ROCKMASTER "16" is the greatest improvement in blasting methods since Atlas introduced milli-second blasting. It cuts drilling and secondary shooting . . . saves on time, labor, and dynamite. Ask your Atlas representative to show you where ROCKMASTER "16" fits into your operations.

See us at the
METAL MINING
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Salt Lake City
August 28-31
BOOTH 114

Our sales and technical personnel will be on hand to assist you with your blasting problems and explain how ROCKMASTER blasting can help you.

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ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

SAN FRANCISCO 4, CAL. ATLAS POWDER COMPANY SEATTLE 1, WASH.

John D. Mitchell Tells of

LOST MINES AND BURIED TREASURES

THE ORGAN GRINDER'S GOLD MINE

Three Italian organ grinders, each with a hand-organ and a trained monkey, were traveling from the placer mines at Ehrenberg to Prescott, Arizona. One day they turned aside from the trail to rest. There, in the shade of a palo-verde tree, they found an old Indian who was almost dead from hunger and thirst. They shared the contents of their canteens with him and provided food from their meager supply.

In gratitude for their kindness, the old Mohave offered to lead them to a rich gold ledge. The Italians hesitated, questioning him as to its size and richness. Finally he stooped over, picked up a handful of pebbles and replied, "Mucho, mucho, lomismo esta," as he swept his arm outward to indicate the extent and richness. The organ grinders needed no further urging and immediately indicated their willingness to follow.

Two days' journey brought them to the Santa Maria River, and on the third day they reached a deep arroyo up in the hills north of Peeples Canyon. A small stream of clear water trickled from under a large rock, and two or three cottonwood trees were growing by the little spring. When camp had been made, the Indian pointed westward, the palm of his hand turned downward to indicate nearness, and said laconically, "Busca." He then stretched out on the ground and smoked a cigarette as if that was the only interest he had in life.

The Italians hurried westward, and when only a few hundred yards away, up a short arm of the main arroyo, their attention was arrested by a narrow vein of dark-colored quartz. They broke off a piece; it glistened in the afternoon sunlight for it was thickly studded with gold. In fact, gold was everywhere in the small ledge, sparkling and glittering whenever the rock was broken. The Italians would rest for a while, gazing at their golden treasure, then break another chunk from the ledge, all the time reveling in dreams of a Monte Cristo. Not until the evening shadows had fallen did they return to the campfire.

The old Mohave slept peacefully that night, but the Italians did little resting, for were they not rich? They ground out many lively tunes on their hand-organs, and the little monkeys danced around the campfire as they had never danced before.

The next day the men returned to the ledge and filled several small bags with the ore they had broken, then prepared to leave because their food supply was nearly exhausted. All the while they made plans to return as soon as possible and dig out their fortunes so they could return to their families in sunny Italy.

They covered up the ledge with earth and rock, marked the location, then drew a rough map of the place to show the most prominent landmarks, indicating the trail leading up from the Santa Maria River to Peeples Canyon and thence to the spring where the cottonwoods grew.

As the sun sank low over the ragged edge of the Western world, the little party started its return trip, preferring to travel at night to avoid an attack by the Haulpais, enemies of the Mohaves. When Tres Alamos Springs was reached in safety they decided to rest for a short while and prepare breakfast, then get an early start for the nearest town which was Wickenburg.

Just before the first faint glow of dawn, there was a sudden bloodthirsty war cry and a small band of Hualpai Indians appeared. They killed two of the Italians and the Mohave, but the third Italian, who was screened by the underbrush, escaped.

The Indians departed hurriedly, evidently in fear of pursuit by the soldiers from Camp Date Creek. After they were gone, the lone Italian placed the bodies of his friends together, heaped brush over them and set fire to the pyre. Next he put the map and some written pages in a small metal box taken from one of the hand-organs and buried it near the spring. Then he turned the three monkeys loose, gathered up the bags of gold and a canteen of water, and set out on his journey across the desert.

Two days later a teamster found him lying face down in the hot sands. Clutched in his hands were the bags of gold. He was given water and although he revived sufficiently to tell the freighter the story of the rich gold ledge, he died before reaching Wickenburg. The teamster is said to have spent many years looking for the gold deposit, but without success.

Nature took its course and the progeny of the three little monkeys that were turned loose to shift for themselves still inhabit that wild and beautiful country of the Tres Alamos and the Santa Maria.

Finally he stooped over, picked up a handful of pebbles and replied, "Mucho, mucho lomismo esta."

ACTIVITIES OF U. S. MINING MEN

LAWRENCE B. WRIGHT, consulting geologist of San Francisco, has been busy doing field work in the northwest. Among other jobs he mapped the geology of accessible workings in the recently unwatered Knob Hill No. 1 mine at Republic, Washington.

Robert Kuntz, graduate of Michigan College of Mining and Technology and employee since 1948 of the M. A. Hanna Company, of Duluth, Minnesota, has been promoted to truck inspector for all Hanna mines. *Robert Anderson*, also a Michigan graduate, who started working for Butler Brothers in 1947 has been promoted to pit foreman at the South Agnew mine. *Leonard Morgan*, a graduate of the University of Minnesota, has been made foreman of the motor repair shop at Hanna's Mesabi Chief mine. And *Bernard Forss*, who started working for Butler Brothers in 1941 also has been promoted to pit foreman at the South Agnew.

Anton Paolo has been made pit foreman at the Longyear Mine, Inter-State Iron Company, Hibbing, Minnesota. He had been assistant engineer. *Robert Carlson* has become pit foreman at the company's Schley mine at Gilbert.

Earl E. Hummer of Duluth, consulting engineer for the M. A. Hanna Company was honored by the University of Wisconsin for outstanding accomplishments in industrial and engineering fields at the University's commencement exercises.

Thomas Burdon of New York City, president of Shattuck Denn Mining Corporation recently made an official inspection of his company's properties in Arizona. He was accompanied on the trip by *S. S. Shattuck* of Bisbee, *R. J. Higgins* of Duluth, Minnesota, and *Andrew Oliver* of New York, all directors of the company.

C. S. Glavinovich has been appointed by the U. S. Smelting, Refining and Mining Company to succeed the late *Arthur M. Hartford* as acting manager of the gold-dredging operation at Nome, Alaska.

Henry Gratton has been transferred from his job as plant superintendent at the Buckeye mine, Hanna Ore Mining Company, Coleraine, Minnesota, to the Ozark Ore Company mine at Iron Mountain, Missouri.

Fred D. Vines has been made assistant chief engineer for the M. A. Hanna Company, Cleveland, Ohio. He previously was central sales manager for the Bucyrus-Erie Company, Chicago, and before that was Bucyrus-Erie's sales representative in the Lake Superior iron mining district.

Frank Sevchek has been appointed plant foreman at the South Agnew mine of the M. A. Hanna Company, Hibbing, Minnesota. *Jasper Garland* was made pit foreman at the same time for South Agnew. At the Weggum open pit mine at Hibbing, *John Bemis* has become foreman. At the Section 18 mine, *Holland Taylor* was promoted to plant foreman.

Seymour Propp has been elected vice president of the Quincy Mining Company, Mason, Michigan. He has been on the board of directors since 1946.

ROBERT R. WEIDEMAN has been made mine manager for Silver Dollar Mining Company at Wallace, Idaho. He succeeds Ernest C. Gnaedinger, who has retired. Weideman moves up from his position as assistant to C. O. Dunlop, general manager of the company.

Loren Hansen has been added to the engineering staff of the Hill-Trumbull iron mine of the Cleveland-Cliffs Mining Company, Marble, Minnesota. He formerly worked for Oliver Iron Mining Company at Hibbing. Another change at the Hill-Trumbull involves *Orin Bell*, who transferred from the engineering department to pit foreman.

Robert P. Pearsall, Jr., has been appointed engineer for the Columbia iron mine, Inter-State Iron Company, Mesabi range, Minnesota.

L. C. Wyman has joined the Atlanta Mining Company, Kelsey, California, as consulting engineer. He had been mining engineer for the California Corporation.

Herman E. Bakken has been named vice president and general manager of the Aluminum Ore Company, effective August 1, according to an announcement made by *A. B. Williams*, president, Pittsburgh. The company is a subsidiary of the Aluminum Company of America. Bakken, who has been with Alcoa since 1919 doing research work, was made assistant director of research in 1928 and associate director of the company's Aluminum Research Laboratories at New Kensington, Pennsylvania, in 1942. He is a member of the AIME and the American Chemical Society. *Dr. Kent R. Van Horn* will succeed Bakken in the associate director's position on August 1. He has been in charge of Alcoa's branch laboratories at Cleveland, Ohio, since 1945, and is also an assistant director of research. He obtained his doctorate degree from Yale University, was president of the American Society for Metals in 1944, and is a member of the AIME, the American Society for Testing Materials, and the British Institute of Metals, as well as author of numerous technical articles and textbooks.

Gerald Hartley, former superintendent of the Round Valley mine at Bishop, California, for the O. A. Kittle Mining and Exploration Company, is now mine superintendent of the Drumlummon mine for the Montana Rainbow Mining Company at Marysville, Montana. The Drumlummon produces 60 to 70 tons of gold ore daily and employs 20 to 25 men.

John F. Stock, Jr., of the United Verde Branch, Phelps Dodge Corporation, Jerome, Arizona, was awarded a certificate of honor by the Joseph A. Holmes Association of the U. S. Bureau of Mines. He received the citation for supervising an underground crew without a single lost-time accident from December 1941 to December 1949, a total of 325,824 man-hours.

C. F. Steinen, E. M. Cregar and *J. Horn* are the incorporators and directors of the newly-formed Western Uranium Mines, Inc., at Delta, Colorado.

Harrison Schmitt, consulting engineer, was named head of the New Mexico Geological Society at the annual meeting held at Albuquerque, New Mexico, recently.

C. W. Bentley, Tovo Maki and *J. W. Coumerilh* were elected directors of the Pilot Silver-Lead Mines, Inc., at a meeting held at Wallace, Idaho, recently.

J. DWIGHT McCLURE has been made manager of ore sales for the Great Lakes Carbon Corporation and will maintain headquarters at the company's New York offices. He had been Los Angeles Division Sales Manager for Permalite lightweight aggregates. In his new capacity he will contact perlite processors through the U. S. to make long-term arrangements for supplying them with prepared perlite ore.

Dorrco Worldwide

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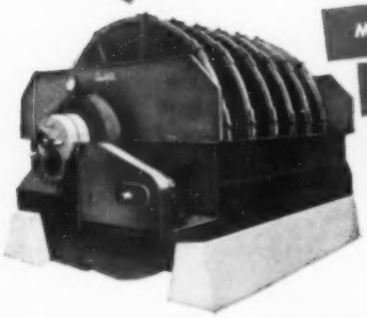

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WORLD MINING

The International Department of MINING WORLD

SAN FRANCISCO, CALIFORNIA AUGUST, 1950

INTERNATIONAL PANORAMA

LIMA—Railroad construction, harbor and dock facilities at the port of Ilo, a concentrating mill and smelter construction are being planned at a cost of $11,000,000 for the Toquepala mines.

NEW YORK—May production of steel in the United States was the largest monthly production in history. A record high output of 8,549,038 tons of ingots and steel for castings was produced.

SANTIAGO—The Huachipato steel plant of the Compania de Aceros del Pacifico has started production of steel at a 600-ton daily rate.

WASHINGTON—The Munitions Board has reported that purchases of zinc for the National stockpile would continue at about the same rate as during the past year.

NEW YORK CITY—The price for lead has been advanced to 14 cents per pound.

WASHINGTON—The United States Government has cancelled its reciprocal trade treaty with Mexico effective December 31, 1950. This treaty permitted a duty of 1½ cents a pound on lead imports. After the cancellation date the lead duty will double.

SOUTHERN RHODESIA—Identification of beryl in a previously unidentified form has created a rush of prospectors to the Victoria area. Large reserves are indicated.

JOHANNESBURG—The Union Bank of Switzerland has advanced 50,000,000 Swiss francs to the Anglo American Corporation of South Africa. The money will be used as a reserve to finance new mining developments in South Africa.

MONTREAL—A third pot line at the Shawinigan Falls plant of the Aluminum Company of Canada, Limited, has been reopened due to the increased world-wide demand for aluminum ingots.

WASHINGTON—The Munitions Board has announced that purchases of copper for the national stockpile will be continued for the first half of the next fiscal year which began July 1st.

HAMILTON, ONTARIO—Dominion Foundries & Steel, Ltd., will build a blast furnace and coke oven at the company's property here.

PARIS—Prices for gold bars and coins recently increased by about 12 percent to reverse the lowering price trend dating from March.

WASHINGTON—The copper import duty of two cents a pound again became effective on July 1st.

BELGRADE—The Yugoslavian government has announced plans to buy American equipment to be used in rejuvenating the Bosnian iron ore mining district.

ROME—The Monteponi Company has installed new equipment at its Vado Ligure zinc smelting plant permitting a 20 percent increase in capacity. ERP funds were used for the project.

NEW YORK—The Allegheny Ludlum Steel Corporation is adding plant facilities to increase the production of titanium metal.

PITTSBURGH—Production of American pig iron reached a record high in May when a 5,797,043 net ton output was made.

BOGOTA—A contract has been awarded to the Arthur G. McKee Co. of Cleveland, Ohio, for the construction of a steel plant at Paz del Rio, Department of Boyaca.

NEW YORK—The price of cadmium has been increased by 15 cents a pound to $2.15. This is the first price increase since November 12, 1948.

BOGOTA—The Exchange Control Board has announced that dollar exchange will be authorized only in amounts equal to dollar receipts for the preceding week.

WASHINGTON—A pilot plant for making a new material called "integrated mica" is nearly completed after 10 years of research.

AUSTRALIA—Strong rumors of revaluation of the £A continue to exert an unsettling influence upon the Australian mining industry.

DETROIT—Great Lakes Steel Corporation will build a new blast furnace as part of a $30,000,000 steel making expansion program.

LONDON—The British Ministry of Supply has announced its selling price for electrolytic copper as £186 per long ton. It is the highest price for English copper during the present century.

JOHNSTOWN—Bethlehem Steel Corporation will spend $32,000,000 to expand and modernize its steel plant here. Ingot capacity will be increased from 1,900,000 to 2,160,000 tons annually.

OSLO—The Norwegian Government has granted a loan of Kr. 500,000 to A/S Bleikvassli Mines, a new company being organized to mine lead-zinc ore at Korgen, in the northern part of Norway.

BRUSSELS—The ECA and the Export-Import Bank will finance road construction in the Belgian Congo. The loan, in the amount of $1,778,000, is for 200 years with 2½ percent interest. $1,718,000 of the loan has been earmarked for purchase of United States road-building machinery.

NEW YORK—The price for platinum has been increased $8 per ounce. New prices are $74 per ounce for large quantities and $77 for small quantities.

The Schumann Plan Seen Through British Eyes

Although many feel that the British Foreign Office has mishandled the Schumann-plan negotiations for a European coal and steel merger and that Britain should at least be sitting in on the talks, there is little doubt about the strength of the trade unions' opposition to any merger.

The British steel and coal workers enjoy the highest standard of living in that industry in Europe. In 1953, according to all the experts, there will be a surplus productive capacity of 8,000,000 tons of steel in Western Europe. That should stimulate efficiency and eliminate uneconomic units. But the unions fear, and history bears them out, that Europe always meets that sort of situation by a cartel designed to limit production and maintain prices. The unions believe, in common with many British owners that the Schumann plan is only a new steel and coal cartel on a large scale. The British steel workers, now breaking all production records and producing the cheapest steel in the world, with the exception of Australia, feel they would prefer competition to cartels.

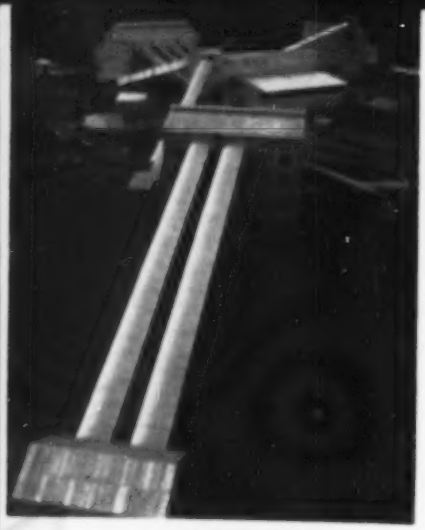
Norway's Mo Steel Plant To Produce in 1953

Progress is reported on the construction of Norway's biggest iron and steel plant at Mo in Rana. Now about 850 men are at work and the repair shops, machine shops and welfare offices have been completed.

The major efforts of the employees are concentrated on construction of the wharf and adjoining warehouses, which will cover an aren of 15 to 20 acres when completed. Dredging of thousands of tons of sand and gravel from beside the wharf is underway so that large ocean-going ships will be able to dock. The railway from the factory to the wharf will be completed the end of this month.

The plant will be powered by electricity brought from a hydro-electric plant under construction at Rossaaga, 25 miles south of Mo, scheduled to be completed in 1953 at which time one pig-iron furnace will be ready to operate at Mo. Two more furnaces will begin operating in 1954, and total electric power necessary to run them will be 110,000 kw. Most of the ore will come from the nearby Dunderland fields.

HEAVY-MEDIA
At World Famous



Photograph reproduced by courtesy of "Die Vaderland," South Africa.

A general view of the new HMS plant at the Premier diamond mine of the Premier (Transvaal) Diamond Mining Co., Ltd., at Cullinan, Transvaal, Union of South Africa. This picture, taken from the top of the headframe, shows the two main conveyors in the foreground leading to the crushing plant from the 2,000-ton stockpile. The inclined-belt conveyor leads from the crushing plant to the 1,500-ton storage bin. This bin is above the 10-mesh wash screen and jig section. The four parallel inclined-belt conveyors convey the minus-1-inch, plus-10-mesh feed to the four cones in the HMS section. The diamond recovery section is in the top right-hand building. The diamond sorting is done in the small, flat-roofed building on the extreme top right. The tailing-disposal conveyor belt can be seen faintly at the top of the picture. It is possible that the tailing conveyor system may be replaced by a system using pumps sometime in the future.

The Premier diamond mine had been on a caretaking basis for 13 years when the Chairman of the Premier (Transvaal) Diamond Mining Company, Sir Ernest Oppenheimer, decided in 1945 on its reopening. This famous diamond mine had produced about 5½ tons of diamonds from nearly 100,000,000 tons of rock. The world famous Cullinan diamond, weighing 3,106 carats (1.3 pounds), was found in this mine in 1905.

In reopening the mine Oppenheimer was faced with a very different position regarding costs from those existing in 1902, the first year of the mine's life. Prices in 1945 were at inflated levels and in general the economic structure of the union had undergone sweeping changes. Labor was no longer as cheap nor was it as plentiful. Both mining and surface treatment plants had to be completely revised. It was essential that the final plans embodied the most efficient units obtainable to secure the greatest possible output in terms of manpower at the lowest possible cost. In effect, the Chairman said to his consultants "give me units in the treatment plant that will improve substantially on the old pan and jig, good and reliable as they were."

Original Plants

Up to 1921, the surface plant consisted of Nos. 3 and 4 gears, on which the capital expenditure according to old records was respectively $896,000 and $857,000.[1] After that date, the former was shut down and the latter was kept in commission until the depression forced the complete closure in 1932. No. 3 gear had a rated capacity of 25,500 loads per 24 hours and comprised five units. Each unit consisted of the following principal components. The conventional grizzly spaced at 2½ inches; two gyratory breakers set at 2½ inches; four sets of corrugated rolls set at 1¼ inches; four roughing pans, followed by two sets of smooth rolls set at ⅞ inch; and four secondary washing pans.

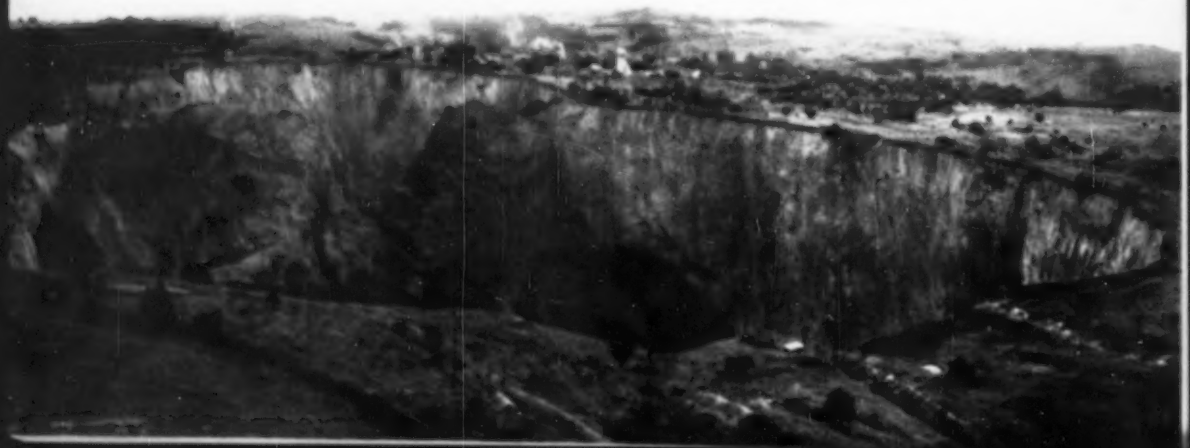
No. 4 gear was a tremendous plant for those early days of the 20th century. With certain refinements to raise the recovery, it was started in 1909. It had a total capacity of 35,000 loads per 24 hours and was built in seven units. Each unit had the following: The invariable grizzly separating at 2½ inches; two gyratory breakers set at 2½ inches; four sets, corrugated rolls crushing at ⅞ inch; eight coarse roughing jigs; one coarse finishing jig; dewatering screens; two sets, smooth rolls set at 3/16 inch; eight roughing jigs; and one finishing jig. The concentrates from both gears were treated in what was then termed the pulsator plant. In this section tube milling, desliming and washing, and close sizing into various products, preceded the extraction of the diamonds on the greased vanners or shaking tables.

Low Costs Before 1932

It can well be imagined what capital expenditure such a plant would entail at current equipment prices. Despite the higher current values of diamonds, present operating costs and labor charges would make the recovery of 80 percent of the mine's output very marginal. Apart from the figure of 100 carats[1] per 100 loads[1] in the very early days, the average yield up to 1932 was not more than 20 carats per 100 loads. Working costs of about 28 cents per load, however,

This spectacular picture of the crater at the Premier diamond mine was taken from the top of a 200-foot-high tower. The surface area of the Kimberlite pipe is 78.6 acres. There is little change in size and shape of the pipe down to the lowest working level.

Photograph reproduced by courtesy of "Die Vaderland," South Africa.



RECOVERS DIAMONDS

Premier Mine

Photograph reproduced by courtesy of "Die Vaderland," South Africa.

The sorters at work are wearing magnifying glasses. Grease table concentrates and some gem stones are shown in front of the nearer sorter. The Tyler sieves, right center, are used for grading diamonds smaller than ¼ carat. The small round brass diamond sieves to the left are used for preliminary grading into: 2 carat and larger; between 1 and 2 carat; ½ and 1 carat; ¼ and ½ carat, and smaller than ¼ carat.

were fantastically low in the light of today's levels. Even more impressive were the over-all costs of the surface treatment at the modest figures of from 4.78 to 5.48 cents. Remarkable figures indeed, but it should be remembered that in the hey-day of the old plants prior to World War I, the loads hauled in one year reached nearly 10,000,000 and up to 900 Europeans and 17,000 natives were employed. The old timers still at the mine, and there are some that have been there almost from the beginning, look back with pride. Those were indeed the days!

Later in the 1920's, when No. 4 gear only operated, the loads treated dropped to between 4,000,000 and 4,700,000 in a year, and numbers employed declined to between 500 and 600 Europeans and 5,000 to 5,600 natives. Costs crept up from 31.5 cents to 42.0 cents, but revenue remained fairly constant at about 56 cents per load.

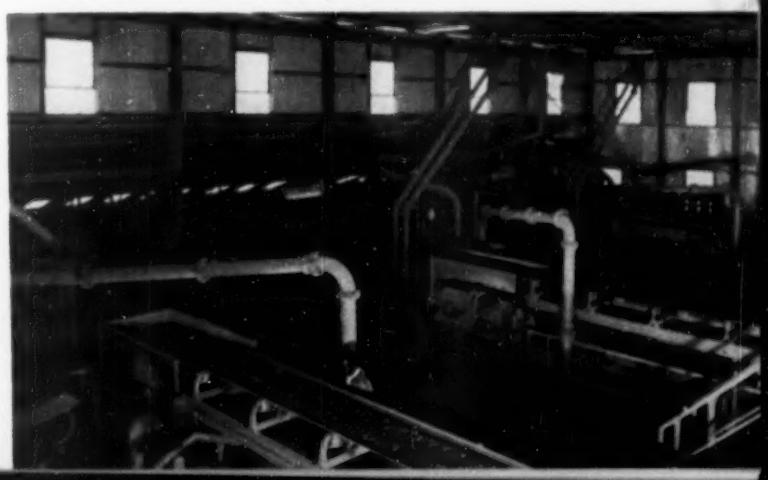
These figures are eloquent testimony of the small margins to which operations must be adjusted at this jewel box of the Transvaal. To their import must be added the fact that the average recovery has seldom if ever been higher than about 1 part in 15,000,000 by weight. Gem stones comprise not more than about 20 percent by weight of the concentrate, with the balance previously misnamed rubbish or bort, but now classified as "industrials." Therefore, the great scale of operations in the early days and the provision for treating up to 400,000 loads in the existing plant require little explanation.

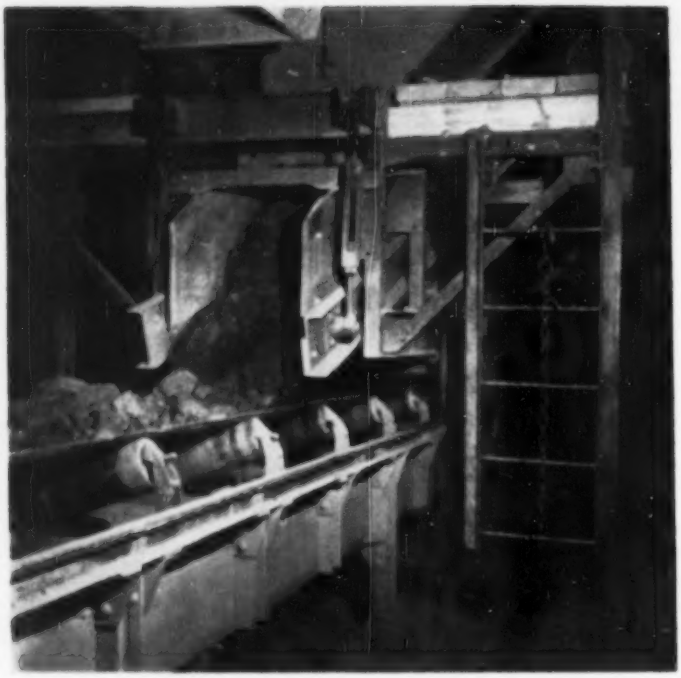
New Plant—Cost Engineering

When the green light was given to the engineers of the Anglo American Corporation of South Africa, consultants to Premier mine as one of the De Beers group of diamond mines, underground operations had to be as carefully considered as the technique of recovery. For diamond recovery it was decided to build a new plant. Heavy - Media - Separation was selected for intensive trial and good fortune attended good judgment almost from the outset. Initial tests were conducted in a small scale model plant treating only a few pounds per hour. Based on the test findings, a pilot plant was erected with a capacity of 100 loads per hour and began operating in August 1947. Highly efficient recovery of diamonds by means of HMS was confirmed and design of the permanent plant was started. Construction was pushed. Despite protracted deliveries and shortages of materials, especially steel, diamonds began their course to the sorters nearly 1½ years ahead of schedule. At the end of June 1950, the permanent plant had been in operation about four months and well on the road to the rated capacity of 400,000 loads per month. When the latter is attained in a three shift operating day of 24 hours, six days a week, the total labor complement is not expected to exceed 400 Europeans and 2,500 natives, most of whom will be assigned to mining. In terms of manpower, the projected tonnage indicates that the objectives set the engineers by the Chairman have been achieved in no mean measure. Compared with the results in the 1920's, the increased loads in terms of the European employee are not marked, but the expected treatment of 1,010 loads per month in terms of one European reflects a substantial improvement over the pre-1914 figure of about 900. The greater efficiency is shown in respect to the native personnel—an anticipated 162 loads per month against 70 in the late 1920's and 54 in the days before the first World War. The reason for differentiation between the European and native personnel is that the work performed by the one is not comparable with that of the other. The former is skilled labor; the latter largely itinerant and unskilled, and it may be emphasized, entirely voluntary.

To bring the Premier mine to the present stage of development and production, more than $7,800,000 representing capital expenditure has been disbursed. On the assumption that the ultimate figure will reach $11,200,000 of which $3,640,000 represents expenditure on the surface treatment plant, total expenditure will be equivalent to about $2.24 per load over one year's operations at full capacity, namely about 5,000,000 loads. According to the lease terms, the South African Government is entitled to 60 percent of the profits after all capital expenditure has been

The plus-10-mesh blue ground is fed to the cones by conveyor belt. Feed to three of Premier's four 16-foot-diameter cones is shown. Note the spotless plant and the native workman in the center foreground.





Blue ground from the 2,000-ton stockpile being fed onto one of the two main conveyor belts which transport it to the crushing plant.

amortized. In the pilot plant during 1949, 567,350 loads were treated with a recovery of 132,267 carats. This represented 0.233 carats per load and at the average realized price for Premier 'parcels' of diamonds in the year, namely $5.775 per carat, was equivalent to $1.34. An accurate figure for total working costs cannot be given at this time, but for what it is worth, it is not expected that they will rise much above 63 cents, of which 17½ to 21 cents will be surface treatment costs, at the full rated capacity of the plant. Provided, therefore, that revenue remains at about $1.34 per load, present indications are that from four to five years may elapse before the lease terms become operative.

Pilot Plant Increases Recovery

Other data that came to light from the 1949 operations of the HMS pilot plant that bring into prominence the benefits of a higher yield than those effected in the old plants were the recovery of 24.37 carats per 100 loads of run-of-mine ground against the previous average of not more than 20, and the recovery of 12.33 carats per 100 loads from old tailings. Until a better substitute is found, the HMS unit appears to have an assured place in diamond recovery practice. Perhaps no finer testimony to its effectiveness can be recorded than the transfer of the pilot plant from the Premier mine to the alluvial diamond deposits of South West Africa.

The principle involved in HMS is by no means new to ore dressing practice in the Union of South Africa. Its extension, however, to the diamond mining industry is a matter of prime interest to operators everywhere. The new plant is very flexible, compact, and under similar economic conditions, much cheaper per unit of capacity than the old plants. Operation and control are simplified and more rapid in effect. Large tonnages can be handled in a continuous process with well near 100 percent push button supervision. Operating efficiency in comparable conditions also tips the scale in favor of HMS. In a developing and expanding economy, where resources of personnel must be nursed, the saving of labor evident in the Premier plant lightens one source of worry from an operator's mind.

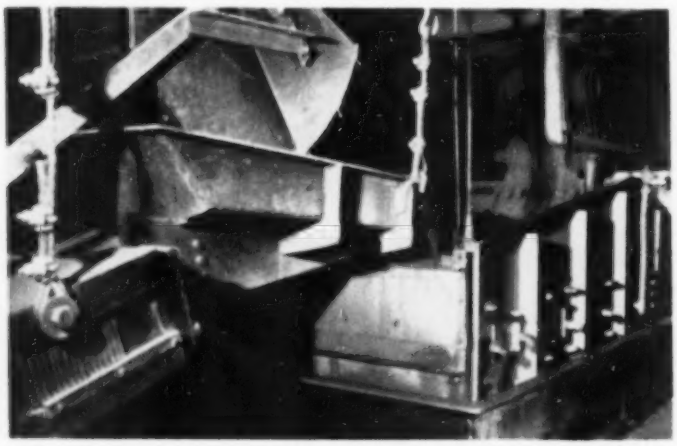
Very Small Stones Recovered

In adapting the process to the recovery of diamonds, the Anglo American engineers had to consider as a matter of prime importance the extremely low content of the diamond to the mass of blue ground,[4] about 1 part in 15,000,000 by weight. They also had to take into account the fact that Premier stones are mostly small; for example past records show that only about 29 percent were larger than one carat and that as much as 70 percent were below ¼ carat (approximately ⅛ inch in diameter). In the latter size range, diamonds as small as 2,000 to 3,000 to the carat are to be found and are well worth recovering.

The Premier engineers decided, on the basis of their large scale pilot plant tests, to screen the crusher product at 10 mesh[5] prior to HMS treatment. Although Heavy Media is being used to concentrate ores at considerably finer sizes than 10 mesh, the presence of slimes in the blue ground would require much larger separatory vessels and additional medium cleaning equipment to enable the recovery of the finest diamonds by this method.

The pilot plant tests also established the optimum specific gravity

Crushed blue ground from the 1,500-ton storage bin being fed by a No. 4 Syntron unit to one of eight 16-by-5-Foot Allis-Chalmers Low-Head washing screens. These screens separate the crushed blue ground into plus-10-mesh feed for the HMS cones, and minus-10-mesh feed for the jig circuit.



of the medium for separating the blue ground (specific gravity 2.7) from the diamonds (specific gravity 3.5). The specific gravity of the medium at the cone overflow is maintained at about 2.87 to produce the float product. The bottom specific gravity is set at from 2.97 to 3.05 to produce the diamond concentrate, or sink. The media used is ferrosilicon, grade 65 (milled to 40 percent minus-325-mesh), with a specific gravity of about 7.0.

Cones 16 Feet in Diameter

In the Premier plant, the separation unit employed is an open cone, 16 feet in diameter, fitted with radial rakes. These revolve at from 5 to 9 rpm. They provide some agitation but are designed specifically to keep the sides and outlet clear of settled media. The cone is fitted with two feed systems, an outer diving ring and an inner circular feed box. The latter is equipped with organ pipe tubes dipping into the cone to varying levels for facilitating an even distribution of feed. The crushed plus-10-mesh blue ground is introduced into the annulus between the diving ring and the feed box, while media is injected into the cone through the latter only. For the float product the cone circuit includes two 14 by 5 foot drain and two similar wash screens, both fitted with $\frac{3}{8}$ inch and 10-mesh screen cloth. For the sink product there is one 10 by 3 foot drain and one similar wash screen, both with 10-mesh cloth. The minus-10-mesh drain from the float and sink products are returned immediately to the cone while the undersize from the wash screens follows the usual circuit of thickening, and cleaning in magnetic separators. The loss of media in the Premier plant is reported as not more than from 0.25 to 0.33 pounds per load of new feed to the plant. About a fifth of the loss appears to be caused by chemical action, through oxidation, and the balance equally through the efficiency of washing and magnetic separation not reaching 100 percent.

It can readily be appreciated that treatment of different ranges of sizings in batteries of heavy media cones would be anything but economic, despite the enhanced efficiency. For this reason only one size range is treated. The lower size limit being 10-mesh. As far as the upper limit is concerned, experience has shown that at one inch the release of diamonds from the gangue was satisfactory and that cleavage of the diamond crystals under the impact of the crusher jaws was reduced to a safe margin. The new feed to the cones, therefore, consists of minus-1-inch, plus-10-mesh material, and as a result the larger stones released are immediately removed in the concentrates. It was found, however, that while the larger stones were satisfactorily released at 1-inch, the minus-1-inch, plus-$\frac{3}{8}$-inch product occluded smaller stones that could be rendered suitable for concentration with further crushing to minus-$\frac{3}{8}$-inch. The plus-$\frac{3}{8}$-inch fraction is therefore screened from the float on the drain and wash screens, recrushed to minus-$\frac{3}{8}$-inch, and rejoins the new feed before being divided into plus- and minus-10-mesh products. In effect, the minus-1-inch, plus-$\frac{3}{8}$-inch range in the new feed forms a closed circuit with the cones. Within the limits of the sizings (minus-1-inch, plus-10-mesh) the Heavy-Media cone gives a recovery of somewhat more than 96 percent, a distinct improvement on the 80 percent in the old plant.

As a point of interest, it may be mentioned that the blue ground contains ilmenite and dikes of calcite with much magnetite. Both of which, in different degrees, would foul the drain and wash circuits of the cones. These two constituents in the minus-10-mesh range are, however, removed on the wash screens that divide the crushed blue ground into the plus-10-mesh feed to the cones and the minus-10-mesh feed to the Denver jig circuit. Very little of these two magnetic constituents are expected to build up in the circuits.

Four cones, each with its auxiliary equipment, have been installed in the Premier plant. On the basis of the estimates derived from the operation of the pilot plant, it is expected that these four units will handle about 80 percent of the new feed or about 320,000 loads per month when the rated capacity of the plant is reached. The concentrates should amount to about 4¼ percent of the new feed or about 18,000 loads per month.

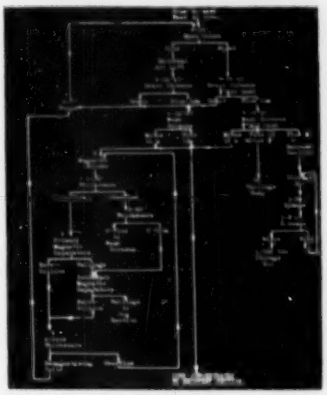
Minus-10-Mesh to Jigs

The Denver jig circuit consists of four pairs of 24 by 36 inch units, each pair being in parallel. The minus-10-mesh from the wash screens is desimed in four duplex Dorr rake classifiers, one for each pair of jigs. The slime is rejected, while the rake product gravitates to the jigs. The jig tailing flows to four additional duplex classifiers, again one to each pair of jigs. The overflow is returned as feed water to the jigs while the tailings are conveyed to the tailings dump. So far the most satisfactory type of screen used in the jigs has been wedge wire with 4 mm. clear spacing. Instead of intermittent removal from the jig hutch, the concentrates gravitate to the sump of a bucket elevator. Each bucket is fitted with a screen cloth drainage section and discharges on to the "fines" concentrates belt to the recovery plant. In this way, a continuous flow is maintained. Preliminary estimates are that the very satisfactory extraction of 90 percent will be made in the jig circuit. The eight jigs, it is estimated, will handle about 80,000 loads per month, and give 5,200 loads of concentrates in the same period, when the rated capacity is reached. These concentrates will include between 12 and 16 percent of the diamonds recovered, if current expectations are realized.

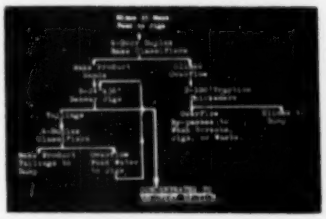
Underground Crushing

For preparing the blue ground for treatment in the HMS and jig sections, the primary crusher is underground. This unit is a 48 by 42 inch

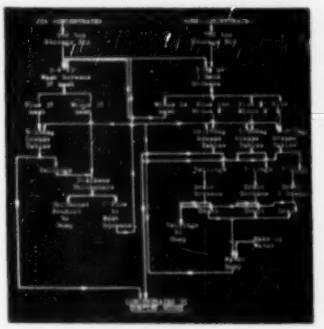
HMS Section



Jig Section
(Minus-10-mesh)



Diamond Recovery Section



One of the Akins Spiral Densifiers handling ferrosilicon media from the sink and float washing screens.

Allis-Chalmers jaw crusher, the setting of which varies according to the balance of the loads in the surface crushing plant, and the fragmentation of blue ground in blasting. The feed consists of grizzly oversize, from plus-8 to 10-inch depending on the spacing of the grizzly bars, the setting of which will be determined by the needs of the moment and is expected to vary from time to time. The reason for crushing underground was to gain an additional 20 to 25 percent effective load in the 12 ton skips.

Stockpile to Crushing Plant

On the surface, two main conveyors from the 2,000 ton stockpile feed the blue ground to the crushing plant, where provision has been made for sorting out up to 15 percent waste in the blue ground hoisted. At this early stage the grizzly bar spacing, and the sizings on the two 12 by 6 foot double deck and one 8½ by 4 foot screens will be determined when the plant has been operating at rated capacity for some time. The product from the crusher plant should be minus-1-inch. To achieve this, the two grizzly oversize products are combined and crushed in a 4½ foot Symons cone crusher. The crusher product is then divided into plus-1-inch material, which with the plus-1-inch product from the other two 12 by 6 foot screens is reduced to minus-1-inch, and the minus-1-inch which joins the final product from the crusher plant. The grizzly undersize is divided into three sizes by the two 12 by 6 foot screens; minus-1-inch which joins the final product from the crusher plant; an intermediate or plus-1-inch size which with the oversize from the 8½ by 4 foot screen is crushed to minus-1-inch in a 5½ foot Symons cone, and a coarse size which is also crushed to minus-1-inch in a second 5½ foot Symons.

In the recrushing section, the minus-1-inch, plus-⅜-inch material from the Heavy-Media float is reduced in three 5½ foot Symons and screened in three 8 by 5 foot screens in closed circuit with the crusher set at ⅜ inch. The undersize joins the minus-1-inch product in the 1,500 ton main storage bin, and according to estimates is likely to average about 40 percent of the new feed or 160,000 loads per month at the rated capacity of the plant.

The 1,500 ton storage bin feed to the treatment plant is washed on eight 16 by 5 foot screens. As stated, the plus-10-mesh constitutes the feed to the Heavy-Media cones, and the minus-10-mesh the feed to the jig section.

It may be asked why crushing to finer than ⅜ inch is not done, either in the recrushing section or in a tertiary crushing circuit. The answer is that it would not be economical, at any rate at the current diamond prices and existing levels of capital expenditure. It is probably felt that with the degree of release of diamonds from the gangue in crushing to ⅜ inch the recovery achieved through the Heavy-Media process is satisfactory. In this connection it is interesting to note the characteristic of the blue ground to break at the point of occlusion or the socket of the diamond in crushing. However, it is possible that further advances in processes of separation and concentration may in time induce a change of policy in this respect.

Grease Tables Catch Diamonds

There are many novel features in the new Premier plant. But the most fascinating remains, as it probably will remain, the battery of grease tables. That is, of course, until an innovation takes its place. The records attribute the discovery of the affinity of the diamond for grease to Fred Kirsten, who in association with a mechanical engineer named Labram, patented the process in 1897. Later their rights were purchased by the De Beers Company, who are responsible for the design of the new type of tables in the present Premier recovery section. This discovery of Fred Kirsten more than 50 years ago cannot be too highly extolled. It was to the diamond mining industry what the cyanide process was to the gold mines of the Witwatersrand. It made profitable declining and very often, low yields. It rendered economic, deep level mining, and the erection of large scale plants. It provided the bond in the ideas and plans of Rhodes and his successors for a great and stable industry in the South African economy.

Diamond Concentrate Treatment

In the Premier recovery section, the cone and the jig concentrates are conveyed to separate storage bins. Before being passed over the grease tables, both the concentrates are thoroughly washed to remove slime that would otherwise foul the grease and reduce its affinity for the dia-

mond. In addition, the feed of the washed concentrates to the tables is controlled to obviate undue surges and to effect as even a flow as possible. Cone concentrates are close-graded into four products: plus-¾-inch; minus-¾-inch, plus-⅝-inch; plus-14-mesh; and minus-15-mesh. Each of the first three products is fed to separate batteries of tables—the plus-¾-inch to tables with three stepped decks sloping at 25°, the plus-⅝-inch to similar tables, but with a slope of 20°, and the plus-14-mesh to similar tables but with a slope of 15°. The water from the table tailing is drained off on inclined screens and being reasonably clear of slime is returned in a closed circuit with the tables to a special sump, where the water temperature is maintained at a high enough point to offset the cold of winter. During summer, the constant circulation of the sump water tends to keep the temperature of the water below the critical point. The minus-14-mesh product of the cone concentrate is conducted to the jig concentrate circuit, and both are washed and deslimed on 35 mesh screens. The deslimed concentrates are then fed to a separate battery of grease tables, with the three stepped decks sloping at 10°. The tailing from these tables with the slimes from the 35 mesh screens are thickened in two Akins Densifiers. The densified product is dispatched to the dump, while the overflow is used as wash water for the screens and for feeding the jig concentrates to the 35 mesh screens. The clear water used on the "fine" grease tables is not returned to the sump. The equivalent make-up water is added to the latter when necessary.

Three grades of topping grease are used on the tables according to the sizing of the feed and the atmospheric temperature. The basic constituents are hard yellow petroleum jelly (m.p. 55° C.) and red petroleum jelly (m.p. 45° C.), mixed in the proportions 50-50, 40-60, and 30-70 for the different conditions already mentioned. Due to partial emulsification and contamination with slime arising from flow of blue ground over the tables, the topping grease deteriorates with use and at the discretion of the operator is scraped off at varying intervals. After the trapped diamonds have been released from the grease with boiling water in grease pots, the used topping is mixed with paraffin wax to the required consistency and forms the base grease for the tables.

The Sorting Office

All the operations associated with the final stages of the recovery of the diamonds are conducted in the "holy of holies" of the surface treatment plant, the sorting office. These operations cover the release of the stones from the grease in the grease pots, cleaning in caustic soda solution, ball milling to break off the adhering gangue, and separation of the diamonds by a simple process of elutriation. A feature of this process is that the very small stones notwithstanding their greater specific gravity tend to float on the surface of the water due to the effect of surface tension, and what may be termed the "non-wetability" of the diamond crystal. After ball milling, electro-static separation of the very small stones has been successfully applied but apparently many passes through the unit are required before the operation can be regarded as having fulfilled its purpose. However, results have been so encouraging that the process is being energetically developed. At the sorting house too, spots of gangue still adhering to the stones after treatment are removed by hand and preliminary grading into sizes by weight is effected. This is the last process at the Premier mine. The final grading and classification of the stones are conducted in the De Beers offices at Kimberley, the traditional diamond center of South Africa.

Premier Mine Truly Great

The Premier mine is great in every respect. The area of the pipe is 78.6 acres or nearly 3,500,000 square feet—the biggest in the world. Its stones are rich in variety and quality—from the exquisite blue-whites, sky-blues, greens, and glowing amber fancies, to the humble "rubbish" or bort now considered among the best industrial stones. Premier "parcels" of classified diamonds can be divided into more than 1,000 different types, a number unrivalled anywhere. The mine is also rich in tradition, not only in the persons who have been on the property almost since the mine's inception in 1902, but in the general atmosphere of friendly hospitality as well.

The same atmosphere extends to the self-contained village of Cullinan, which serves the Premier mine and is situated almost on the rim of the great kimberlite pipe itself. Accommodation for all the employees is provided but what shortage exists in the way of houses is to be eliminated by the erection of additional dwellings. These are rented out at the relatively nominal rate of $8.40 per month, while water and light are supplied free of charge. Pretoria—the Administrative Capital of the Union of South Africa—is only 23 miles away, and can be reached with ease by automobile, train or bus.

The whole atmosphere is quiet, peaceful and hopeful, as befits a community for whom the second spring has broken. If the spirits of the departed retain an interest in mundane affairs, then it is hoped that those of the mine's discoverer and the company's first chairman, Sir Thomas Cullinan, rest well content.

NOTES

1 All conversions from the South African pound sterling have been made at the rate of $2.80 to the pound.

2 The diamond weight of a carat referred to is equivalent to 200 mgs.

3 A load is equivalent to 0.9 short tons or 1,600 pounds. The term dates from the early days of diamond mining in the Union of South Africa, when it was found that the effective load of a one-ton car with broken ground was equivalent to 0.9 ton.

4 Blue ground is name given to the green shblue peridotite or "Kimberlite" breccia filling of the diamond-bearing pipes.

5 All references to mesh sizes are to the Tyler Scale.

One of the sorters weighing diamonds on the sensitive diamond scale.

Photograph reproduced by courtesy of "Die Vaderland," South Africa.

In transportation...

Willison Automatic Coupler

National NC-1 Truck

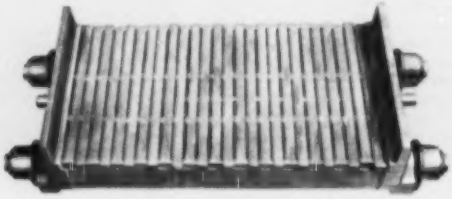
National M-225 Rubber-Cushioned Draft Gear

National M-230 Rubber-Cushioned Draft Gear

Naco Steel Swivel Hitching and Link

In processing...

Ore-Grinding Balls



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New National NC-1 Trucks provide a smoother ride that results in less wear on cars . . . reduces impact on roadbed . . . minimizes spillage. Willison Automatic Couplers give maximum safety . . . speed up coupling, gathering and shunting . . . reduce surging, spilling and danger of derailment. National Rubber-Cushioned Draft Gears provide smooth cushioning action that reduces shock and protects equipment.

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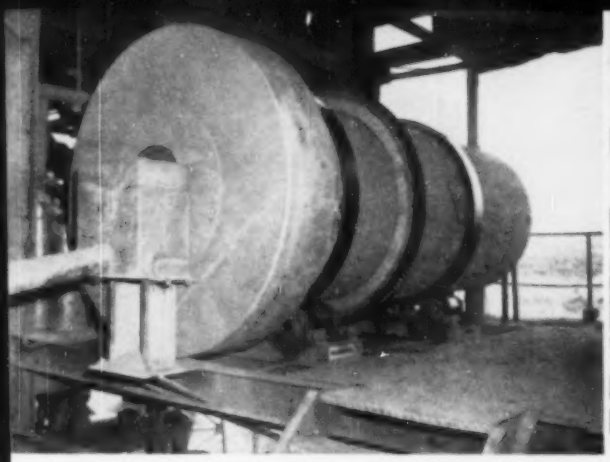
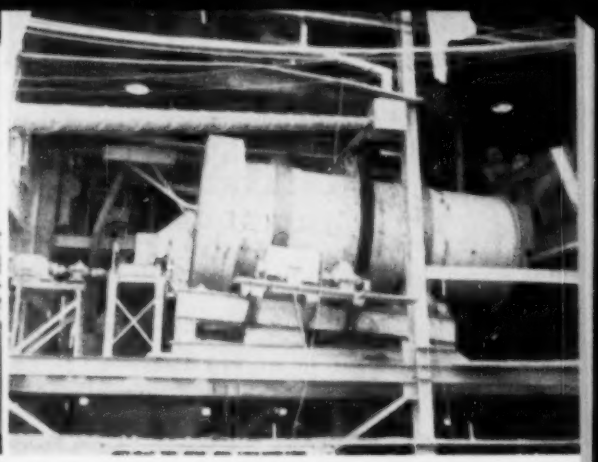




Left: Two of these 5 by 12 foot Hardinge counter-current classifiers are used in the media cleaning circuit for thickening the media ahead of the magnetic separators. Right: This 7 by 16 foot Hardinge Separator at the Hill Trumbull mine treats coarse feed in the Heavy-Media Separation circuit. Metallurgical results are satisfactory and maintenance costs are low.

Cleveland-Cliffs Iron Company Uses Separator on Trumbull Ore

The first commercial application of a Hardinge Heavy Media Separator to low-grade iron ore is at the Hill Trumbull operation of the Cleveland-Cliffs Iron Company near Taconite, Minnesota. After one season of operation, it has proved to be a highly satisfactory piece of equipment. A second installation at the Harrison mill of the M. A. Hanna Company near Cooley, Minnesota, also is reported to have established a good performance record; and other plants are installing the units in preparation for the 1950 season.

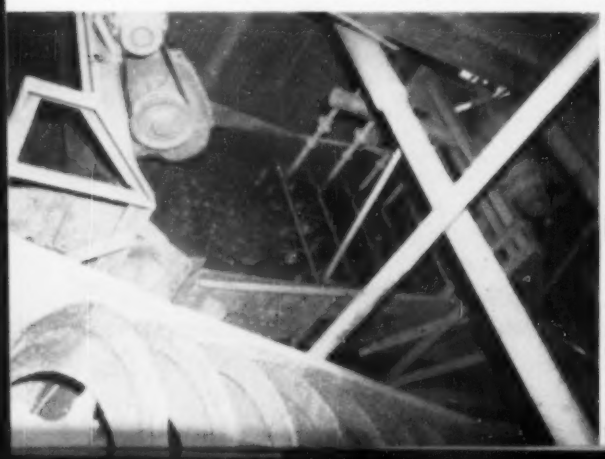
The separatory vessel is, basically, the same as the Hardinge counter-current classifier except of heavier construction. It is a revolving drum 7 feet in diameter, 16 feet long, and set on a slope of ¾ inch to the foot. The drum has spiral flights attached to its inner surface. These flights increase in height from the feed end to the sink discharge end so that the last flight is exposed above the surface of the pool. The discharge end of the drum is fitted with a narrow cylinder, somewhat larger in diameter than the drum, that contains lifter bars which elevate the sink material and drain it of excess medium before discharging it.

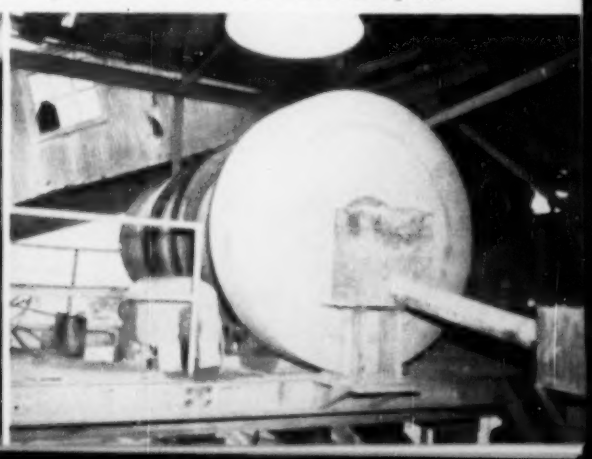
Both feed and medium are introduced at the low end of the drum. The concentrate settles and is carried up the drum by the spiral flights while the float is carried out the low (feed) end along with the excess medium. The rotating action of the drum causes the material to roll and thus give each particle maximum exposure to the medium. This tends to free trapped float and let it rise to the surface. Some medium is introduced at the discharge end to set up a counter-current action and carry float material to the overflow.

The drum is encircled by a pair of steel tires that ride on cast steel bearing wheels mounted on roller bearings. It is driven by a 15-hp. motor, through a speed reducer to a spur gear that encircles the drum near its center point.

After extensive laboratory work, but without commercial testing, the

Left: A bird's eye view of one of the washing screens and densifiers. Allis-Chalmers low-head vibrating screens with 1½-mm. wedge slot stainless steel screens are used to recover medium from both the sink and the float materials. Identical Akins spiral densifiers are used to control the specific gravity of medium in both of the cleaning circuits. Right: Discharge end of the Hardinge counter-current classifier used in media cleaning circuit.

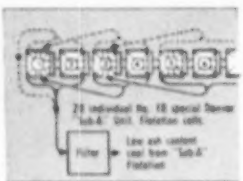




FOR COMPLETELY FLEXIBLE FLOTATION RESULTS USE THE

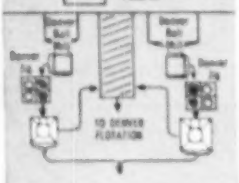
DENVER "SUB-A" UNIT FLOTATION CELL

Roddymoor* Coal Flotation England



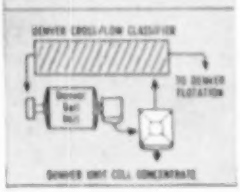
Extreme flexibility is provided by using Denver "Sub-A" Unit Flotation Cells. Mr. H. Nelson of England's National Coal Board, says, "*. . . Denver Flotation Cells have proved ideal for our purpose; being flexible enough to allow almost any combination of flows, and extremely low in maintenance costs.*"

Coarse Gold From Grinding Circuit



Free gold and gold associated with chalcopyrite, are much easier to float in a dense pulp, easily maintained in a Denver Unit Flotation Cell. Such high densities in subsequent flotation circuits cannot be satisfactorily handled, thus making even more desirable the recovery of coarse values in the grinding circuit.

Slime Loss Reduced in Copper Plant



Decreasing slime loss in copper circuit is the function of this Denver "Sub-A" Unit Cell. Recovery of copper at a coarse *size* eliminates overgrinding and resulting slime losses. Combined concentrate of Unit Cell and subsequent "Sub-A" Flotation gives higher average grade as well as higher total recovery.

**Read this complete story in May-June, 1950, Deco Trefoil.*

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY — FLOTATION ENGINEERS

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DENVER EQUIPMENT COMPANY, 1404 17th St., Denver 17, Colorado

machine was installed at the Hill Trumbull plant.

Briefly, the flow of material is from a surge pile of minus-1½-inch material, via a 42-inch by 7-foot Link Belt pan feeder and a 24-inch conveyor belt, to an Allis-Chalmers double deck screen with ½-inch square openings on the top deck and ⅛-inch Wedge Bar screen on the lower. The Wedge Bar was substituted for punched plate to eliminate a bad blinding condition.

The oversize from the top screen is conveyed to the Hardinge Separator, the oversize from the lower screen is treated by HMS in a 78-inch Akins Separator and the minus-⅛-inch material is treated by abrasion milling and Humphrey's Spiral concentrators.

As indicated, the material directed to the Hardinge separator is introduced, along with medium at 3.10 to 3.40 specific gravity, at the low end of the machine. The float material overflows to the pool of an Akins spiral for dewatering. The coarse product of the spiral passes to the washing screen.

The sink, after being carried through the drum by the spiral flights, is picked up by lifter bars and discharged, almost media-free, directly onto a 24-inch conveyor belt. The product is delivered to the media drain wash screens.

The handling of both products as well as the cleaning of dilute and contaminated medium is almost identical to that in most other plants using ferrosilicon and the heavy media process. There is, however, one other exception in equipment. In the media cleaning circuit, two 5 by 12-foot Hardinge counter-current classifiers are being used, along with one Akins spiral classifier and two Dorr thickeners, for thickening the medium ahead of magnetic separation. It is believed that this is the first commercial installation of Hardinge classifiers for this purpose, and their operation compares favorably with the performance of other types of classifiers in similar service.

In installing the Hardinge Separator, the Cleveland-Cliffs management anticipated that the principal benefit of its use would be reduced maintenance costs, and this has proved to be correct. Repair and replacement dropped sharply. Electric power consumption is also reduced somewhat.

From a metallurgical standpoint, the results have been comparable to those previously obtained on the plus-½ to 1½-inch size range. Testing has indicated that equally satisfactory results would be obtained on the ⅛- to ½-inch size range.

Actual operating results over the past season at Hill Trumbull:

Feed		*Concentrate*		*Tailing*	
Percent Iron	Percent Silica	Percent Iron	Percent Silica	Percent Iron	Percent Silica
41.82	35.58	53.42	13.03	21.56	65.86

The operation was conducted under rather closely controlled conditions, and additional operating data are available.

SUPERIOR PERLITE PRODUCER

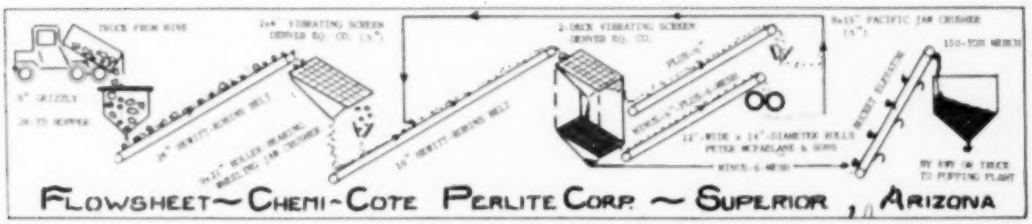
At Superior, Arizona, Chemi-Cote Perlite Corporation will sell sized perlite to independent popping plants

The logical way to produce expanded perlite is to crush and size it at the mine, to ship it to the point of consumption, and then at the point of consumption (some large city like Houston, Texas or Los Angeles, California), to expand it for sale to the consumer. In that way, the volume of material to be handled and shipped is kept to about one-seventh of the final-product volume.

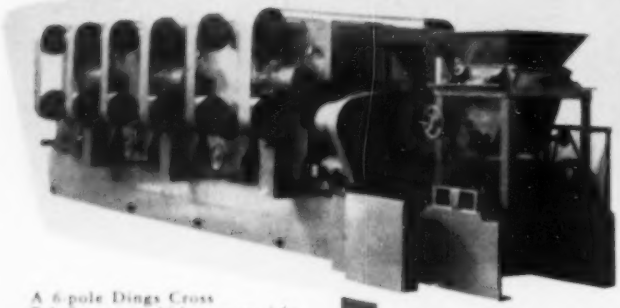
Processing crude from the company's mine near Superior, Chemi-Cote Perlite Corporation's new crushing plant one mile southwest of Superior, Arizona has just started to produce 100 tons daily of crushed and sized perlite for sale to independent popping plants of the southwest. Fay Young MacDonald, executive director of the company, has placed supervision in the hands of Jack Wellington, the engineer who designed the plant. Jack's 25 years in the production of sized aggregate qualify him for the new job as plant manager.

Raw perlite, ready for popping, is carried by a cross conveyor belt to railway cars north of the final storage bin, or to trucks on the southerly side of the bin.

Raw perlite enters by truck over the ramp on the right, passes through the crushing and sizing system to the raw perlite storage bin in the center. Eventually a rotary kiln will be installed on the foundation near the left, at which time the product from the kiln will be stored in the bin on the left. In the distance can be seen the stack of the Magma Copper Smelter.



THE MOST POWERFUL MAGNETIC SEPARATOR EVER BUILT FOR THE MINING INDUSTRY



A 6-pole Dings Cross Belt Separator which on many jobs will do the work previously requiring an 8-section separator.

FOR TREATMENT OF
such materials as:

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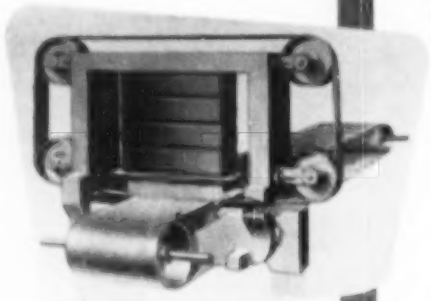
Purities of 99.8% Obtainable!



Material to be separated is carried on the main belt conveyor under a series of magnet and cross belt assemblies. Magnetic particles are attracted to the under side of the moving cross belt which sweeps them to the side to be separately discharged. Each magnet assembly can be adjusted to remove a desired magnetic fraction.

The DINGS Improved Cross-Belt Machine

for Concentration and Purification of minerals

IMPROVES EFFICIENCIES, REDUCES COSTS

MANY operators of mills have long been familiar with Dings Rowand-Wetherill Cross Belt Type Separators. Now Dings offers an improved version of this famous separator which offers new opportunities for improved separations, greater capacities, simpler operation and lower maintenance. The most important feature of the new machine is a patented pole nose construction which gives a tremendously concentrated magnetic flux which will accomplish separations not before possible. Three individual pole noses are used on each cross belt, each of which will remove as high a percentage of the magnetics as an entire cross belt section will in the ordinary cross belt machine. It is therefore possible to accomplish the desired separations with fewer cross belt assemblies and hence a smaller and less expensive machine. The machine has been greatly simplified and the adjustments minimized down to that of the air gap alone.

The efficiencies and economies of the new Dings Cross Belt Separator are worth your investigation. Write for full details. No obligation.

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YOU WON'T SAY "DANG IT" IF YOU "DING" IT

PROMINENT MEN IN INTERNATIONAL MINING

H. K. Hylkema, mining engineer, has been living in Holland for the past several months where he can be reached in care of the Billiton Mining Company, The Hague. Formerly he was in Celebes, Indonesia.

Norton Jackson has moved from Vatukoula, Fiji Islands, to Flinders Street, Adelaide, South Australia, where he works for the Australian Department of Mines.

Th. R. Seldenrath, mining engineer and specialist on methods of tin mining, mechanical coal mining, and rock pressures, has been in Bolivia to deliver a special message on behalf of the UNO. He is a professor at Technical High School, Delft, Netherlands.

L. H. Hinckley, former chief engineer for Panaminas, Inc., at Manila, has become superintendent of mines for Marsman & Company, P. O. Box 297, Manila, Philippines.

Torsten Jensfelt has been made chief mining engineer for Bolidens Geuvaktiebolag, Gruvforvaltningen, Boliden, Sweden. He was consulting mining engineer for Stora Kopparbergs Bergslags A. B. at Tuna, Hastberg.

P. E. Fairbairn has moved from Johannesburg, c/o Anglo-American Corporation, to Hertfordshire, England c/o Little Brewers, Hatfield Heath, Bishop's Stortford.

Walter Lewiecki has left Silver City, New Mexico, U. S. A., for Dodoma, Tanganyika, Africa, where he will do geological work for the British Colonial service.

Ronald L. Prain has been elected chairman of Roan Antelope Copper Mines Ltd., Rhosesian Selection Trust Ltd. and its subsidiary, Mufulira Copper Mines Ltd., according to a release from London. The companies have copper concessions in Northern Rhodesia. Prain also is chairman of the Anglo Metal Company, Ltd. He had been managing director of Roan and Mufulira since 1943.

F. W. Goddard, who was assistant mill superintendent for American Smelting and Refining Company's Parral Unit and before that the Avalos Mill Unit at Chihuahua, Mexico, has been made acting mill superintendent at the Angangues Unit of the company at Angangueo, Michoacan, Mexico. The mine there is primarily a silver producer, mill capacity is 530 tons per day, and lead, iron and zinc concentrates produced at the mine are all smelted in AS&R Mexican plants. Goddard worked for the South American Development Company in Ecuador from 1934 to 1946.

The Hon. H. Vivian Smith of London has been appointed a director of Rhodesia Broken Hill Development Co., Ltd., which has mines at Broken Hill, Northern Rhodesia.

Sir Ulick Alexander recently was made chairman of Zambesia Exploring Company, Ltd. The company, which holds stock in several Tanganyika mining companies, maintains its head office in London.

RUI RIBEIRO FRANCO has returned to his position in the Departmento de Mineralogia e Petrografia, Sao Paulo, Brazil, after taking an advanced course in geology and geophysics at the Geophysical Laboratory at Washington, D. C. He continues also as one of MINING WORLD'S foreign correspondents.

ERNEST G. ENCK recently spent some time in Africa and Europe inspecting mines and conferring with operators and government officials about their problems in order to bring more accurate information regarding the potential tonnages of certain minerals and raw materials of interest to his company, the Foote Mineral Company, 18 West Chelton Avenue, Philadelphia, Pennsylvania.

L. A. Crozier, former mine superintendent for the Associated Mining Company of Fiji at its Loloma mine, is now general manager for the Raub Australian Gold Mining Company, Ltd., Malaya.

A. K. Denmead has been appointed assistant chief government geologist for Queensland, Australia.

J. M. Newman, chairman of directors, Mount Morgan, Ltd., Queensland, Australia, is on a trip to England and Canada to observe the latest developments in the treatment of pyrites.

J. P. L. Kenny has been appointed geological consultant to Al Consolidated Mines, Gaffney's Creek, Victoria, Australia.

J. F. Breen of Kalgoorlie, Australia, field superintendent for the Western Mining Company, Ltd., is in the U. S. A. studying Lake Superior, Michigan, iron mines.

A. G. Robertson has been made special assistant to the manager of the Metallurgical Division, The Consolidated Mining and Smelting Company of Canada, Ltd. He has been with Cominco since 1935, starting as a testing engineer. *L. M. DeLong* has been appointed superintendent of the company's Refining Department. He began with Cominco as a chemist in 1927.

HAJIME KAGAYAMA, director and chief engineer of the Matsuo Mining Co., Ltd., of Tokyo, Japan, is making an extended tour of the mining districts in the United States. He also will visit many manufacturers of mining machinery, as the increased labor costs in Japan necessitate increased mechanization. Matsuo's underground pyrite mine in Aomori Prefecture is producing 60,000 tons of pyrite per month. The pyrite is shipped to sulphuric acid plants in all parts of Japan.

Christian Gloslie has been appointed assistant resident manager of Yukon Consolidated Gold Corporation, Ltd., which maintains offices at Vancouver, B. C., Canada. He will continue to supervise the plant and electrical departments of which he was superintendent.

R. Sholto Douglas, mining engineer, has been engaged by the Kingdom of Saudi Arabia as an advisor on mining matters and has left California, U. S. A., for Jedda to take up these duties. He was an adviser with the U. S. Bureau of Mines in Seoul, Korea, after the last war and recently has been making a survey of metal mining in America.

Swedish Minister of Commerce Eriksson has appointed *Mr. Lundvik* chairman of the Geological Research bureau and has named as assistants: *E. J. Bengtsen, P. A. Geijer, M. von Willebrand* and *R. Mannerskantz*. They will supervise the job of organization of the bureau.

Dr. Wrede has been appointed managing director of the Otanmaki Mining Company, a state-owned firm in Finland.

E. J. Carlyle, secretary emeritus of the Canadian Institute of Mining and Metallurgy, and *Humphrey M. Morgans* received honorary membership in the Institution of Mining and Metallurgy at the London meeting recently. The Institution also inducted *Colonel L. C. Hill* as president and *Robert Annan* honorary treasurer.

T. A. J. Braithwaite has been nominated new general manager of the Wankie Company in Southern Rhodesia.

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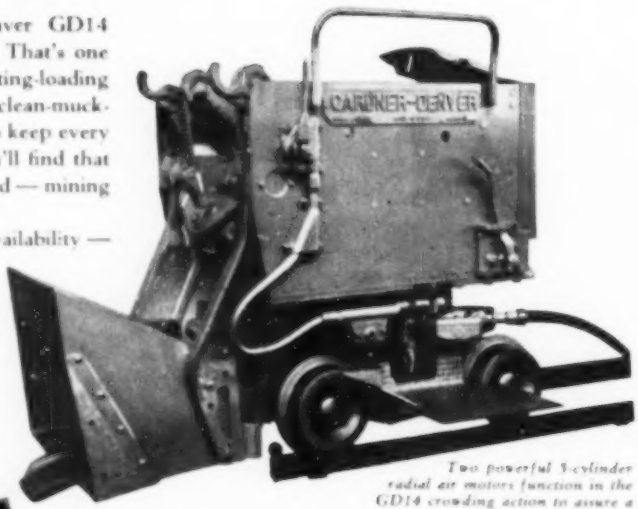

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INTERNATIONAL NEWS

MAJOR UNITED STATES STEEL COMPANIES INCREASE PLANT FACILITIES

Announcements of multimillion dollar expansions in steelmaking plants in the eastern part of the United States seem right in line with the present capacity output the steel business is enjoying. Some of the main programs about to begin or already underway are listed below:

For about $32,000,000 Bethlehem Steel Corporation will expand and modernize its Johnstown, Pennsylvania, plant. Twenty open-hearth furnaces will be enlarged from an individual capacity of 135 to 150 tons per heat, and ingot capacity will be increased from 1,900,000 tons to 2,160,000 tons annually. By enlarging three of the five blast furnaces and installing better equipment, pig iron capacity will be raised by 216,000 tons per year. Coke production will be increased from 76,000 tons per month to 112,000 tons. A 45-inch, high-lift blooming mill will be installed. Thirty large soaking pits for heating ingots will be constructed to replace old small ones. Part of the purpose of this project is to consolidate operations and eliminate the bad location of the various plants in relation to each other, a factor which has made production costs far greater than they should be.

For an estimated $25,000,000 to $30,000,000 National Steel Corporation will expand blast furnace, coke, and open hearth facilities at properties of its subsidiaries, the Great Lakes Steel Corporation and Weirton Steel Company, in order to increase ingot capacity by 500,000 tons a year for a total of 5,000,000 tons a year. The main project is construction of a new blast furnace with a 40,000 ton-per-month pig iron capacity at Great Lakes' plant near Detroit, Michigan, where three other furnaces already are in operation. The new furnace should be in operation in January, 1952. Great Lakes' coke plant near Detroit will be enlarged and an open hearth furnace at the Ecorse, Michigan, plant also will be rebuilt and enlarged. Its capacity will become 500 tons per heat. All of Weirton Steel Company's existing open hearth furnaces at Weirton, West Virginia, will be enlarged.

Allegheny Ludlum Steel Corporation is erecting a building for pilot plant refinement of titanium matte at Watervliet, New York, to raise production of this metal and is experimenting with a pilot plant for the continuous casting of steel. If this casting process is worked out satisfactorily the company may be able to pour 14,000 pounds of shaped steel per hour, and produce additional products for the competitive market. At its existing titanium plant Allegheny turns out 500-pound ingots which are sent to factories for experimentation in jet aircraft use and the like. Matte for the plant is supplied by National Lead Company. The high cost of refining and melting titanium has slowed large scale commercial utilization, a problem the company hopes to solve.

Granite City Steel Company of St. Louis, Missouri, will spend $2,600,000 in plant improvements in order to increase output of cold-rolled products from 25,000 tons to 40,000 tons monthly. The company will cease manufacturing plates and hot-rolled sheets.

Youngstown Sheet and Tube Company will construct four new open hearths and auxiliary facilities in the Chicago, Illinois, area, to increase capacity from 4,082,000 tons annually to 4,300,000 tons or more, according to J. L. Mauthe, president.

Republic Steel Corporation, Youngstown, has blown in its No. 5 blast furnace after a year's idleness. In this area operations have been at about 106 percent of capacity with three Bessemer convertors, 72 open hearths and 23 blast furnaces going.

The outlook for steel appears very good for some time to come if major companies are willing to spend great sums to boost production and streamline operations.

Spain's Five-Year Plan to Increase Metal Output

Part of Spain's five-year plan for industrialization is devoted to the opening and expansion of mining plants, and details of these projects have been presented by Juan Antonio Suanzes, Spanish Minister of Industry and Commerce.

Geological surveys are in progress in order to find new deposits of gold, iron ore, coal and oil. In Granada the production goal from the recently-discovered iron mines is 500,000 tons annually. The mines are estimated to contain 35,000,000 tons of ore. At Santander, a new washing installation is expected to treat 100 tons of zinc and lead ore daily and produce annually 400-600 tons of zinc concentrate and 800 tons of lead concentrate. Other lead mines will contribute 4,000 tons of lead concentrates to yearly output. The Asturian steel project, yet to be started, is estimated to be able to produce 600,000 metric tons of plate and alloy steels when first opened and eventually 1,000,000 metric tons.

By 1951 the metallurgical industry expects to increase present output by 200,000 tons of tinplate yearly, 2,300 tons of aluminum (later expected to reach 5,000 and then 10,000 tons), 15,000 tons of steel sheets, 3,000 tons of zinc and 4,800 tons of lead.

Swiss Invest 50 Million Francs in Free State

Development of Orange Free State mines, South Africa, already aided by British and American funds, will be further aided by Swiss investments. The Hambros Bank of London has negotiated a loan of 50,000,000 Swiss francs ($11,200,000) to the Anglo-American Corporation of South Africa from the Union Bank of Switzerland.

Anglo-American Corporation will add the amount to the funds already at hand to develop seven Free State mines.

Haut-Katanga Mines Continue Expansion

In Belgian Congo at the property of Union Miniere du Haut-Katanga, the expansion program under way is progressing smoothly and further expansion includes the construction of two new hydro-electric power plants. The plants will generate 500,000,000 kilowatt hours a year until 1953 when capacity will be 1,000,000,000 kilowatt hours, with the power used by other public and private services besides the mines.

Recently an agreement was made providing for Union Miniere and Societe Generale Metallurgique de Hoboken, its subsidiary, to join a new French company in leasing the Palais electrolytic refinery near Limoges to which Union Miniere will send a minimum of 180,000 tons of copper ore in the next 15 years, according to the contract.

The company's copper output for the 1949 year was 141,399 tons. Ore mined during the year totaled 2,974,616 metric tons, a figure which includes cobalt, zinc, cadmium, silver, gold, palladium and uranium tonnages. Reserves of copper and cobalt ore have been increased. Operation of the Ruwe mine near Kolwezi in place of the depleted Luishia mine is providing equally as much tonnage to annual figures.

CHARLES WILL WRIGHT ADDS WHITE PINE COPPER RESERVES TO "TOMORROW'S COPPER"

In Charles Will Wright's article "An Accounting of World Mining for 1949" in the April 15, 1950, issue of MINING WORLD, he answered the question "Where will tomorrow's copper come from?" by giving estimated tonnages and grades of ore reserves of the San Manuel mine in Arizona and The Greater Butte project of the Anaconda Copper Mining Company at Butte, Montana. Since then he has received from his good friend, Frank A. Ayer, vice-president of Copper Range Company, a copy of that company's 1949 report which gives the following information regarding development progress at its White Pine mine located near Lake Superior on the northern peninsula of Michigan:

Total positive plus probable reserves at end of year in short tons	249,610,000
Average grade in pounds of copper per ton	22.3
Total tonnage parting shale ore in short tons	156,770,000
Average grade in pounds of copper per ton	24.3
Total tonnage added to reserves in year 1949	50,000,000

The drilling program is being continued in 1950 and results are said to be as favorable as in 1949. To date only that part of the mine which has been drilled northeast of the White Pine fault has been included in reserves but a few holes southwest of the fault show definitely that the ore is there but is displaced some 1,500 feet vertically.

Mr. Wright was informed that the company will start off by mining the parting shale only because it is higher grade—24.3 pounds per ton—and has an excellent hanging wall of silicified sandstone which will stand with rooms 35-feet wide or possibly more.

The above information indicates that White Pine might yield as much copper as San Manuel because of the former's higher grade ore and large undeveloped areas. In any case the property will undoubtedly be a great national asset and a source of substantial amounts of copper for years to come.

Cominco Mine Project To Cost $500,000

The Consolidated Mining and Smelting Company of Canada, Ltd., Trail, British Columbia, is carrying out another step in its overall, long range plan for ore development and extraction at the Sullivan mine at Kimberley, B. C. at an approximate cost of $500,000. The Sullivan is the largest-known orebody of its kind and annually produces over 2,000,000 tons of lead-zinc-silver ore.

The present project calls for the installation of two conveyors to raise ore from the 2,850-foot level to the 3,350-foot level and the excavation of the 7 by 15-foot inclined tunnels to accommodate these conveyors. The latter part of the project has already been completed. The conveyors will consist of 36-inch rubber belts and will be operated by 200-hp. motors.

The new conveyor sections will connect with the six-section conveyor system installed in 1944 and will permit ore to be raised from as low as the 2,850 level up to the 3,800 level from which point it can be loaded into cars and hauled out of the mine on the recently completed direct low-level haulageway to the concentrator.

The total length of the six original and two new conveyors will be in excess of 4,500 feet and the system will handle 400 tons of ore per hour. The individual conveyor sections are interconnected by an automatic control system which shuts down the whole installation in the event that one section becomes inoperative.

Contract Awarded for Colombia Steel Plant

The contract for general engineering, procurement services, and supervision and construction of an integrated iron and steel plant for Empresa Siderurgica Nacional de Paz del Rio at Belencito, Boyaca, Colombia, has been awarded to the Arthur G. McKee Company of Cleveland, Ohio. Design and construction will take about three years to complete and will cost about $45,000,000.

According to H. R. Moorhouse, secretary of the McKee company, the plant will have a blast furnace, coke ovens, basic Bessemer steel-making plant, and rolling mills with an initial capacity of 100,000 metric tons of finished iron and steel products annually.

Nicaraguan Gold Mines Increase Development

Compania Minera La India and its subsidiary, Empresa Minera de Nicaragua are under the same management, and the principal stockholder in the two gold properties is Noranda Mines, Ltd., of Canada. Both properties have 400-ton mill capacity, use cyanidation processes for extraction of the gold, and are characterized by orebodies found in wide quartz structures in andesite and a continual problem of excessive water in both the underground and surface workings. The mines are located 40 kilometers apart and 125 and 110 kilometers north of Managua, respectively.

Recent development at La India's property includes the completion of the 9,000-foot drainage tunnel driven to intersect the vein 220 feet below the lowest working level. The tunnel has reduced operating costs greatly and opened several lower levels to exploration and prospecting, in addition to increasing ore reserves. The company has added to the diesel power plant and to compressor capacity. The shaft is being sunk now to the drainage tunnel level. In addition to this underground work, an extensive program of surface exploration is in progress and has been a factor in the establishment of new production records. Harry Long is general superintendent, and Hugh Wills is mine superintendent.

At the Empresa property, known as the Limon mine, a new shaft was completed last year and underground workings have been extended to intersect large surface deposits. Additions were also made to the power plant and compressed air capacity. The company acquired the old Santa Pancho mine last year and is developing it extensively. Carlos Almazan is general superintendent of the Limon and E. C. Hagie is mine superintendent. Donald Neeland Spencer is vice president and general manager of both companies.

Spain Outlines Plans for Higher Steel Output

Spain must double present steel output in order to meet her industrial demands. As a consequence many ambitious plans are under way, and the government itself has decided to construct a steel plant in the Asturias region. The plant will be jointly owned by the State-controlled National Industrial Institute, by foreign interests, and by existing steel companies, if they wish to participate.

Expansion and modernization is affecting the following established plants:

The Duro Felguero plant has installed a 300-ton capacity mixer, is installing three Bessemer converters, fifteen 300-ton capacity furnaces, and a battery of coke plants. The result is expected to be 30,000 more tons of steel annually.

The Fabrica de Mieres plant is completing installation of three Robert converters and an 80-ton mixer, and expects to increase production by 20,000 tons annually.

The Echevarria plant (Recalde) is

increasing production of sheet metal by 7,000 tons for a total of 20,000 tons yearly. By 1951 the company hopes to produce 200,000 tons of fine metal plate and tin plate.

A total annual production of 1,500,000 tons of steel is the ultimate aim for private companies and this amount plus eventual production of 600,000 tons from the government's Asturias plant should satisfy the home market. Among problems to be solved to reach this aim are the shortage of scrap and coking coal and electric power and the resistance of operators to the lowering of prices because of a rise in production.

New Guinea Prospecting Company Formed

The Australian Commonwealth Government and the British Aluminium Company, Ltd., have formed a new company, the New Guinea Prospecting Company, Ltd., registered at Papua, New Guinea, and capitalized at £1,000,000.

The new company will locate and develop hydro-electric power and will search for bauxite and other minerals necessary to produce aluminum.

The Australian Government holds 51 percent of the shares and will nominate a chairman and two out of five directors.

Nevada Approves Leases For Processing Plants

The Nevada Colorado River Commission has formally approved the contracts with Combined Metals Reduction Company and National Lead Company for leases and purchase options on parts of the state's Basic Magnesium plant at Henderson, Nevada.

Combined Metals is completing a refinery which should be ready for production by 1951 and at that time the company will take over the leased units. The refinery will produce manganese, zinc, and lead from concentrates that will have been processed in a plant to be built at Pioche.

National Lead has contracted for two units and has asked for two more if a second allotment of 80,000,000 kilowatt hours of power annually can be provided by the Commission. National Lead will complete in late 1951 a large titanium processing plant and has scheduled operations for early 1952 when power requirements become available.

Harvey Machine Company, the third large firm requesting space and power at Basic, has not had its contract approved yet to establish an aluminum industry as the Commission wishes to study further the company's request for about half—or 300,000,000 kilowatt hours annually—of the power available at Basic. If Harvey should get this power, National Lead would be unable to obtain the two additional units it would like to have until more dams were built on the Colorado River.

Several other companies, mainly Basic Reduction Company, Western Electro-Chemical Company and United States Lime Products Company, either have been granted or are negotiating for some of the 622,000,000 kilowatt hours of Boulder and Davis dams power allotted to the state's plant.

SOMALILAND—The *Montecatini General Mining Company* of Milan, Italy, is reported to be negotiating the concession for mining research in the former Italian Somililand on the British frontier. Iron ore deposits have been discovered warranting further study.

FRENCH GUINEA—Iron ore deposits in the Conarky peninsula will be developed by an ECA loan of $1,976,000 for mining equipment.

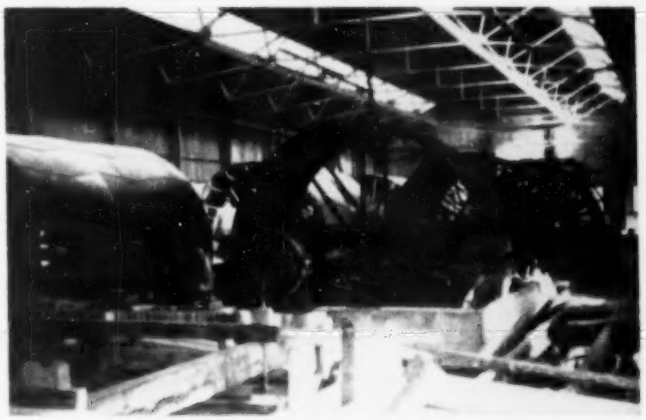
FRENCH MOROCCO — *Societe des Mines de Zellidja* expects to produce about 30,000 tons of zinc and the same amount of lead this year, and during 1951 will probably increase zinc output to 40,000 tons. The increased tonnages will help make France more self-sufficient with respect to its zinc metal requirements.

ALGERIA—The *Ras el Ma* mercury mine, where the production cost is higher than for Spanish and Italian mercury, has had to cease all exploitation.

SOUTHERN RHODESIA—Following the identification of beryl in the Fort Victoria area in a previously unknown crystalline form, many small mine operators have rushed to the scene and staked claims. The presence of beryl in this district has been known for 30 years, but proved quantities were too small for profitable mining. About seven months ago many tons of an unidentified mineral familiar to prospectors in the area was found to be beryl of excellent grade. In the same area a large deposit of lithium-bearing rock also is reported to exist.

SOUTH AFRICA—Gold production in the current year is expected to be 11,000 oz. less than last year's output (about 528,000 oz.) because of the continued rise in production costs and the diminishing native labor forces, particularly for underground work.

SOUTH AFRICA — Increases in milling capacity and underground development are reported by *Consolidated Murchison Goldfields and Development Company*, antimony and gold producer in the eastern Transvaal. During 1949 mill capacity was increased to 11,400 tons monthly. Total development footage cut was 14,512, and of 5,087 feet sampled, 2,810 feet was found to be payable. Satisfactory exposures of antimony



FILTER PLANT INSTALLED AT GEDULD

Above is the Frazer and Chalmers filter plant under construction at Geduld Proprietary Mines, Ltd., P. O. Dersley, East Rand, Transvaal, South Africa. The company is milling approximately 100,000 tons of ore monthly and treats the ore in a sand-slime cyanide plant. The mine is one of the oldest gold producers in the East Rand, having opened in 1908.

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ore were made in the Monarch and United Jock sections, but no further ore was disclosed in the Free State section, and development in the West Jock has yet to show payable values. Diamond drilling in the Weigel section indicated a limited tonnage of payable ore on the fifth level. In the Gravelotte section, development down to the fourth level disclosed an orebody of higher-than-average antimony content and plans are being made to sink a shaft below this level.

MOROCCO—*L'Omnium Nord-Africain* is undertaking the construction of a 25 km. long aerial tramway in order to transport manganese over the Atlas Mountains. The deposits are located south of the chain of mountains and the use of the tramway will lower transportation costs of the ore about 50 percent.

ALGERIA—A workable uranium deposit has been reported at Hammam Bou Hajar, Oran. The U $_3$O$_8$ content is estimated to average one percent.

TUNISIA—A 45-day strike in February and March, 1949, and a second strike in November and December of the same year made phosphate production during 1949 fall 20 percent compared with the 1948 production (1,441,900 tons against 1,863,700 tons). The second strike still influenced production in the first quarter of 1950 during which time only 350,000 tons against a normal average of 460,000 tons was produced. March and April production in 1950 returned to the regular rate of output, however, with 170,700 and 158,600 tons respectively.

TUNISIA—Strikes affected the *Djerissa* mines from November 1949 to February 1950. As a result, 1949 production was only 678,800 tons of iron ore instead of an estimated 760,000 tons. Normal production was resumed this March (63,800 tons) and followed in April (62,600 tons).

FRENCH NORTH AFRICA (Algeria, Tunisia and Morocco)—Lead production from these three countries during the first quarter of 1950 was more than 21,000 tons, compared with 18,000 tons in the same period of 1949. Extraction of zinc has declined however—5,000 tons compared with 9,000 tons. In Tunisia production of lead in April rose to 2,410 tons; and in the first four months of the year exceeded by 29 percent the output in 1949 for the same period. Among Tunisian mines increasing their production are the *Touireuf* mine, whose output is 132 percent greater than last year, and the *Garn-Alfaya* and *Djebel Semene* mines which have begun operating new flotation mills.

KENYA—The *Colonial Development Company* has taken over the *Macalder* mine and plans to explore the deposits and set up the property for early production. Ore from the mine contains copper, gold, lead, zinc and silver.

PERU — The *Toquepala* mines, owned by the *Northern Peru Mining and Smelting Company*, are at present under intensive exploration and preliminary development work. Employees and laborers' living quarters are being erected and the road connecting the mining properties is nearing completion. A concentration plant and smelter will be installed, and a new railroad is to be built between the mining properties and the "Estacion Hospicio," a distance of 109 km. and may be extended later to Desaguadero, 300 km. further. Construction of docks at the port of Ilo also is involved in the project. Total cost will be about $11,000,000.

CHILE—*Caja de Credito Minero* is said to be preparing for the installation of a lead refinery near the *Paipote* copper smelter. Construction should start this year; cost is estimated at 8,000,000 pesos.

BOLIVIA—Production from *Patino Mines & Enterprises Consolidated, Inc.*, in the first five months of the current year was 3,773 long tons of fine tin, a drop of 332 tons from last year in the same period. According to Joseph C. Rovensky, chairman, the company is trying to increase production and has two plans in mind to accomplish this. One plan is to negotiate with the Bolivian Government for a reduction of the "divisa" requirements so as to retain more dollars and sterling received from sales of tin outside and the use of that money for further equipment and supplies. The other plan is to introduce the block caving method rather than using the selective method of mining high grade veins only. A trial of the block caving method in October gave good results, he said, and Herbert G. Moulton, a director and mining consultant for Patino, said that mining of low grade ores would increase reserves very substantially.

COSTA RICA—Increased production is anticipated during the year by *Miramar Exploration and Mining Company* which is operating the *Zamora, Bonanza*, and *La Union* mines. The first two are company-owned and the latter is run by an operating agreement with the owners. Miramar, with Alfred C. Bean as manager, has shut down the 15-ton, diesel-powered Bonanza mill and is milling ore from that mine at the 40-ton, hydro-powered La Union mill at a considerable saving in money and increase in output. Dore bullion and flotation concentrates are produced at each property.

CHILE—Production of 600 tons of steel daily has begun at the *Huachipato* plant at Concepcion, owned by *Compania de Aceros del Pacifico*. Annual output is estimated at 180,000 to 240,000 tons.

BRAZIL MINE INCREASES OUTPUT 129%

The Mineracao Rosado gypsum mine, which is near the most easterly tip of South America in the Brazilian state of Rio Grande Do Norte, has installed a new Allis-Chalmers HD-19 tractor and a 24-cubic-yard Gar Wood scraper. The mine formerly used 250 burros and 600 men to produce 24,000-metric tons of gypsum in the seven-month working period each year. With the new equipment no burros are used and production is 129 percent higher (55,000 metric tons each season). Hand labor continues to be used to discover and select the different qualities of gypsum to be mined.

MEXICO—The Mexican small-scale-miners union (Union Mexicana de Mineros en Pequeno) is favoring Bonanza, Zacatecas, over Concepcion del Oro, Coahuila, as the site for the small smelter it intends to establish for the benefit of its members and other small scale operators in Zacatecas and Coahuila. Rail and road services at Bonanza are much better.

JAMAICA—A bauxite law has been passed by the Jamaica House of Representatives to permit the Government to make mining agreements with mining companies to extract the metal. Chief among the companies affected is the *Reynolds Metals Company* which will pay the Government one shilling a ton royalty on ore mined. Reynolds expects to go into production in 1952 when pier construction is finished and new buildings and machinery have been installed at the company's west coast property.

PERU—According to Frank F. Russell, president, the output of lead and zinc will surpass in importance the output of copper from *Cerro de Pasco Copper Corporation's* mines at La Oroya, Peru. He advised that the company would invest some Corporation funds and a large amount of borrowed funds to develop the lead and zinc potentialities of the mines.

MEXICO—The Ministry of National Economy has forbidden the *Minerales Mexicanos del Sur, S. A.*, to allow removal, even of assay samples, of any ore mined at the supposed uranium deposit at Jalapa del Marques, 45 miles from Tehauntepec, Oaxaca. The Government will carry on complete investigations before ore is released. Minerales Mexicanos is a subsidiary of the *Tennessee Product and Chemical Company*, Nashville, Tennessee, and has been supplying the parent company with large amounts of iron ore (in April 3,000 tons), said to be of excellent grade. However, officials suspect that this ore also contains uranium.

BRITISH WEST INDIES—The *Reynolds Metals Company* of Richmond, Virginia, has sent two of its men, Walter L. Rice and M. W. Henry to London to buy $14,000,000 worth of British mining equipment if prices and specifications are satisfactory. The equipment will be used in the new bauxite mines in Jamaica. The main item to purchase will be a 13,000-ton ocean-going ore carrier which will be self-loading and unloading, the latter taking 10 hours instead of the usual three days by dock methods. When Reynolds starts operating its Jamaican property, 500,000 tons of bauxite ore will be carried annually to the docks by a six-mile ropeway.

ARGENTINA—A blast furnace with a capacity of 1,200 tons daily is to be constructed by the *Sociedad Mixta Siderurgica*, according to reports. The company also will install four open-hearth furnaces capable of handling 160 tons each and a rolling mill with a 250,000-ton capacity per year.

NORWAY—*A. S Aardal Verk*, the Norwegian aluminum plant, is installing equipment which will raise production substantially above last year's total production of 10,000 tons.

RUSSIA—Both chrome and manganese shipments from this country to the United States have ceased. Also, a marked drop in total Russian imports is seen by comparing March and April shipments—those in March amounted to $2,900,000 and those in April amounted to $1,700,000.

GERMANY—*Bemer Metallhandel und Schmelzwerk GmbH (Bremen Metal Trade and Smelting Works Ltd.)* has established a zinc and lead smelting plant at Bremen mainly to remelt zinc at a rate of 200 tons per month.

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(C) Lug Chuck . . . In Blue Brute Drifters the one-piece chuck sleeve reduces friction, holds alignment better, allows the piston to hit cleaner and harder. Worth considering when you remember that the chuck area is a major trouble-spot in ordinary drifter design.

Continuing the Blue Brute feature story, there's the scientific balance . . . the freedom from vibration . . . and the short-stroking under heavy loads that reduces the stuck-steel nuisance . . . all of which speed up drilling cycles, cut operating costs and keep operators happy.

Why not let your miners try Worthington Drifters — the WPM (Pneu-Motor on drifter), the WPMS (Pneu-Motor on shell) or the WHC (Hand Crank). Meanwhile, for further facts proving *there's more worth in a Blue Brute*, write for literature on the complete line.

BUY BLUE BRUTES

See Worthington's Exhibit in Building 8, Spaces 129 and 133, at Salt Lake City Mining Show

Semi-Portable Compressors. Drifters with Feed Motor Incorporated. Drifters with Feed Motor on Shell. Hand-Crank Drifters. Stopers. Hand-Held Rock Drills.

WORTHINGTON

Worthington Pump and Machinery Corporation
Construction Equipment Department
Harrison, New Jersey

Distributors In All Principal Cities

SCOTLAND—On the Shetland Islands, field work is being carried out by the *Geophysical Prospecting Company* of London to investigate the extent of the possibility of developing magnetite deposits. During the war a 70-foot shaft was sunk and a large amount of ore mined but operations ceased soon after the North African landing. The Geophysical company is concentrating its prospecting work at depths below 500 feet.

SPAIN—Investigations have been going on at the Navarra and Gataluna potash deposits with very satisfactory results. One drill hole in the Navarra region indicated a seven-foot thick layer of sylvite assaying 20 percent potash, according to reports. Also, several layers of carnallite were located. Drill holes put down at the Gataluna properties indicates a possibility of 500,000,000 tons of potash at the very least. If production can get under way in these fields and if estimates of tonnages continue as high, Spain would be a leading producer of this fertilizer mineral.

ITALY—Reports on investigations made in the Chiavari and several other districts of Italy indicate that the production of copper and manganese is expanding. In the Chiavari district at present, the Tremonti and the Monte Pu manganese mines are producing 2,000 tons a month, and arrangements are under way to reopen the copper-pyrite mines of Libiola, Bardeneto, and Montebianco which can produce 2,300 tons of ore a month. The *Ferromin Company*, which exploits the manganese mines of Cassagna and Gambatesa near Chiavari in the province of Genoa and produces 3,000 tons of copper a month, has extended its research work into the Nosiglia and Pontori zones, in the districts of Ne and Mezzanego, where geologists claim that manganese reserves may allow production of 10,000 tons a month. The company also has been exploring copper resources in the vicinity of the Rio Fossello and Molin Cornaio, Massana district (La Spezia), where geologists have found traces of high grade copper.

FRANCE—Bauxite production rose from 58,500 tons in February to 71,000 tons in March. (The 1949 monthly average was 64,000 tons). Aluminum production, benefited by a rise in electrical energy output, rose to 4,500 tons in March from 3,250 tons in February. (The 1949 monthly average was 4,500 tons.)

CORSICA—During the first quarter of 1950, 1,050 tons of asbestos was extracted from the Canari mine.

ENGLAND—Geologist Ian Ford has advised the Harwell atomic research station of his discovery of radioactive minerals in the Bath and Bristol districts. Officials think deposits may extend 12 miles and contain 100,000 tons. Investigations are being made.

NETHERLANDS—The *Royal Dutch Oil Company* and the *Standard Oil Company* of the United States put down three holes in the vicinity of Schoonlo village, province of Drente, and with the first hole found gypsum at a depth of 142 meters, then drilled 415 meters of pure rocksalt to an ultimate depth of 641 meters. The second hole encountered the salt at 777.5 meters and stopped at 832.5 meters in rocksalt. The third hole reached 718 meters without finding the salt dome. The diameter of the dome is possibly no more than 2 km.

ITALY—Now under construction is the new Martin and Thomas steel plant in Genoa Cornigliano, being aided by ERP funds and to be operated by the *Societa Italiana Acciaierie Cornigliano (S.I.A.C.)*. In connection with this project an official announcement has been made that the *Finsider* group at Rome, controlling the S.I.A.C., and the Algerian iron mining industry have reached an agreement whereby the latter will supply 1,000,000 tons of ore yearly to be processed in the new works.

GREECE—During the first five months of 1950 Greek metal output included 60,000 tons of pyrite; 45,000 tons of iron ores, 6,000 tons of lead, 15,000 tons of chrome ores, 11,000 tons of nickel ore and 40,000 tons of magnesite. To increase production further the Greek Government is negotiating a loan from France to help reorganize and streamline the industry.

ALBANIA—Bauxite has been found by officials of the Albanian Ministry of Industry in the northern Albanian mountains northeast of the Lake of Skodra. Geologists estimate that about 10,000 tons could be mined yearly for 15 years, an output which could be increased with good machinery. The Albanian Government is negotiating with leaders of the Swiss aluminum industry to secure their support for the exploitation of the properties.

RUSSIA—*Degtiarka* copper mine in the Urals is said to be producing 60,000 tons of ore monthly due to recent installations and modernization of existing equipment. The mine is one of the largest in the country. Smelting is done at Sams (Pervouralsk).

NORWAY—*A/S Bleikvassli Mines*, now being organized to mine lead and zinc deposits in Korgen, may receive a loan of Kr. 500,000 from the Department of Industry. Zinc production has gone down in the past 12 years from 14,800 tons to 10,000 tons per year and the Department would like to encourage larger production.

WESTERN GERMANY—In spite of all protests, dismantling of pot-line No. 3 at the aluminum reduction plant in Toeging is to go on. However, the magnesium plant of *Wintershall A. G.* at Heringen will not be dismantled.

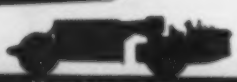
TASMANIA—Commonwealth Minister for Supply (Mr. Beale) predicted that the Bell Bay aluminum plant will be in production by June, 1952. This assumes Tasmanian Government hydro-electric power will be available by that date.

BORNEO-GOLD COAST—Both British North Borneo and Africa's Gold Coast are being contemplated as future sites for aluminum production by the *British Aluminium Company Ltd.*, of London, and *Aluminum, Ltd.*, of Montreal, Canada, who are making a joint study of the possibilities of these regions. At present Britain depends largely on Canada for aluminum supplies, and for bauxite Canada depends on British

35 m.p.h. "C" HAULS

. . . converts to STRIP

Other interchangeable tools for C TOURNAPULL



18-ton bottom-dump
TOURNAHOPPER

30-ton flat bed
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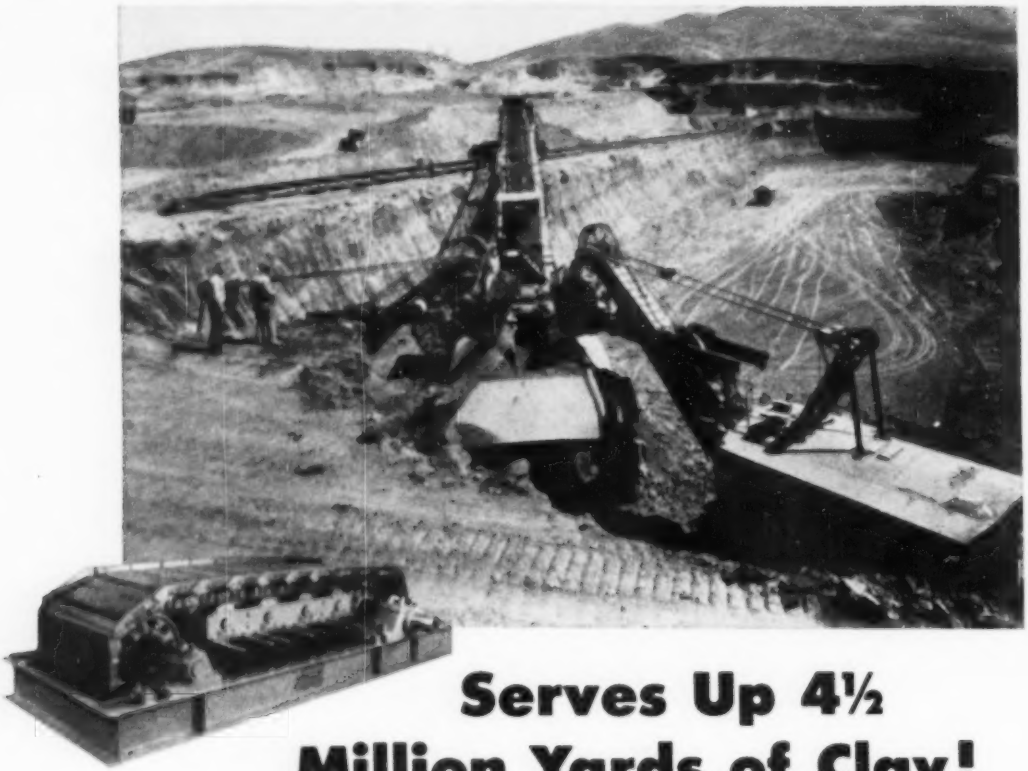
15-ton
TOURNACRANE

6 or 7-yd
TOURNAMIXER



Serves Up 4½ Million Yards of Clay!

ONLY 4500 HOURS WORK FOR "S-A" AMSCO PAN FEEDER

This dam construction job was no exception to AMSCO'S capacity "to take it" on the toughest jobs. A really heavy-duty unit was required for use under the receiving hopper of a portable field conveyor handling material from pit to main belt conveyor system serving dam site. This S-A AMSCO feeder was the logical choice. Heavy-duty operations require 4,500,000 yards of clay to be moved to the dam.

The extra-wide pans of the AMSCO prevent arching or blocking of the clay in the throat of the bin. S-A engineers have built tremendous strength and high-efficiency into this sturdy unit for lasting, trouble-free service. It's typical of S-A engineers to come up with practical answers to some of the toughest problems in low-cost material handling. What are your problems? Write today.

DAM CONSTRUCTION PROJECT

Clay is excavated by two 5-yard shovels. A shovel works on each side of the hopper for maximum capacity. Clay is dumped into receiving hopper which is part of a movable, pendulum-type conveyor which loads onto main 30-inch belt conveyor at any point. The 60-inch wide by 22-foot long AMSCO Pan Feeder has pans 1¼" thick. It is installed as a floor under the receiving hopper and feeds materials through an adjustable gate opening onto a shipping roll. There, revolving teeth reduce material to less than 6-inch lumps. The capacity of the AMSCO Feeder is 1000 cubic yards per hour.

STEPHEN S-A ADAMSON MFG. CO.

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DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

Guiana. Bauxite for aluminum production in Britain is imported generally from the Gold Coast.

PHILIPPINES—*Lepanto Consolidated Mining Company* is installing machinery and equipment to double capacity at its Mankayan, Mountain Province, property. During May the company produced 16,025 tons of copper-gold ore valued at $533,650.

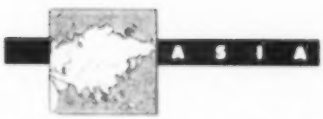
NEW SOUTH WALES — Port Kembla will be the site of the new tinplate plant to be built by Australia to alleviate the present acute tinplate shortage, according to I. M. McLennan, general manager of *Broken Hill Proprietary*, Australia's biggest steel producer. He said the Commonwealth would be capable of producing 500,000 tons of steel by 1952 and the tinplate plant was part of a long-range project.

NORTHERN TERRITORY—Four parties of geologists, geophysicists, and geochemists from the Commonwealth Bureau of Mineral Resources were reported active in Northern Territory during July at Rum Jungle (radioactive minerals), Brock's Creek (gossan outcrops), Tennant Creek (gold), and Harts Range (radioactive minerals and mica).

TASMANIA—Output and value of tin-tungsten ores of *Aberfoyle Tin Mines N.L.* for the first 42 weeks of the company's financial year were up. Levels Nos. 7 and 8 have now been opened and prospects are encouraging.

SOUTH AUSTRALIA — Consolidated Zinc Corporation is reported as test-drilling pyrite deposits at Nairne. Main interest is in the sulphur content. The drill holes will go to a depth of 500 feet.

NEW SOUTH WALES—*New Occidental Gold Mines N. L.* has completed the first hole of its deep drilling campaign. Drilling on the Gladstone orebody intersected the lode at 1,070 feet, carrying low gold values and 3.68 percent copper values over a true width of 17 feet. The Chesney and Occidental orebodies will be drilled to 4,000 feet depth.



INDIA—The Indian Government has arranged with a London firm of consulting engineers for the building of the biggest silver refinery in the East at Alipore, Calcutta. The refinery will cost about £500,000. Its main job will be the extraction of about 300,000,000 ounces of pure silver from around 600,000,000 silver coins which India is replacing by cupro-nickel coinage. Some difficulties are expected as Indian peasants will not want to give up silver for cupro-nickel money. But Britain wants the coins replaced as soon as possible as she lent the silver to India after bor-

Construction

EXAMINE THESE FEATURES— PROVE TO YOURSELF THAT HYDROCONE CRUSHERS WILL DO A JOB OF FINE REDUCTION CRUSHING FOR YOU!

GOOD NEWS for crushing men! Now — you can meet fine reduction crushing requirements in a new, wider range of capacities. The line of *Hydrocone* gyratory crushers has been expanded by A-C to include sizes up to 84-in. diameter cone with a maximum receiving opening of 17-in.

With hydraulic product size control you can change product size *instantly*. Push-button operation on larger *Hydrocone* crushers; hand crank control on the smaller machines. No tools required.

Hydrocone crushers are available with fine, intermediate or coarse crushing chambers . . . offer a capacity range of 10 to 1000 tons per hour. The A-C representative in your area can give you more facts on this expanded line. A-5098

ALLIS-CHALMERS, 985A SO. 70 ST.
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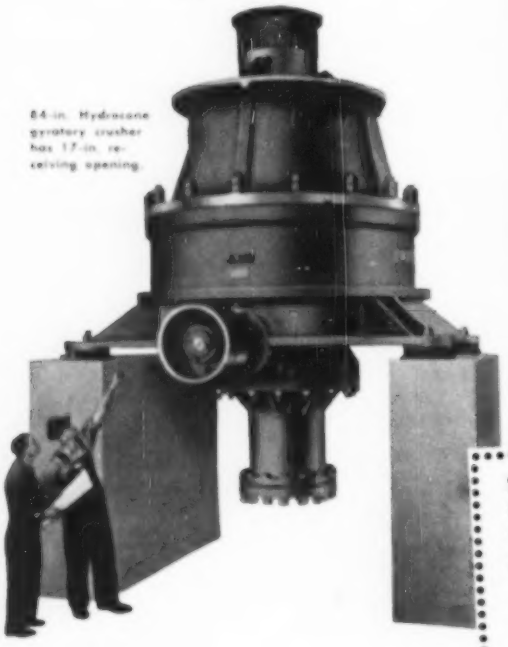


84-in. Hydrocone gyratory crusher has 17-in. receiving opening.

WOBBLE PLATE FEEDER distributes feed evenly . . . standard equipment on crushers with fine crushing chambers — can be supplied on others as well.

SLEEVE TYPE spider bearing is readily replaceable . . . greatly simplifies maintenance. Used on larger size *Hydrocone* crushers. Ball and socket type spider bearing supplied crusher sizes up to 48-in. In both types, lubricant is retained by an efficient seal enclosing the main shaft.

ONE-PIECE outer crushing surface is a concave ring cast of manganese. Necessity of zincing or clamping the concave ring in place is eliminated by ground-to-fit finish on the outer surface and the use of an effective self-locking device.

ONE-PIECE inner crushing surface, like the concave ring, is cast of manganese, designed for long wear. Complete contact of the ground inner surface with the steel head center eliminates zincing in all but the largest sizes. The mantle is held tightly in place by the self-locking head nut.

HIGH CAPACITY crushing chamber of any of the three standard types is designed to assure a continuous, uniform product. The shape of the mantle and concave ring, and the large adjustment range available, results in maximum life and minimum scrap when replacing parts. Special crushing chambers also available for special applications.

FINE CRUSHING CHAMBER | INTERMEDIATE CRUSHING CHAMBER | COARSE CRUSHING CHAMBER

THREE-PIECE step bearing supports the main shaft on the hydraulic piston. Designed to withstand crushing pressures much greater than those encountered in actual service.

FULLY AUTOMATIC lubricating system consists of storage tank, pressure type filter, condenser type cooler, and motor driven oil pump. Flow and temperature switches in the oil line protect the crusher.

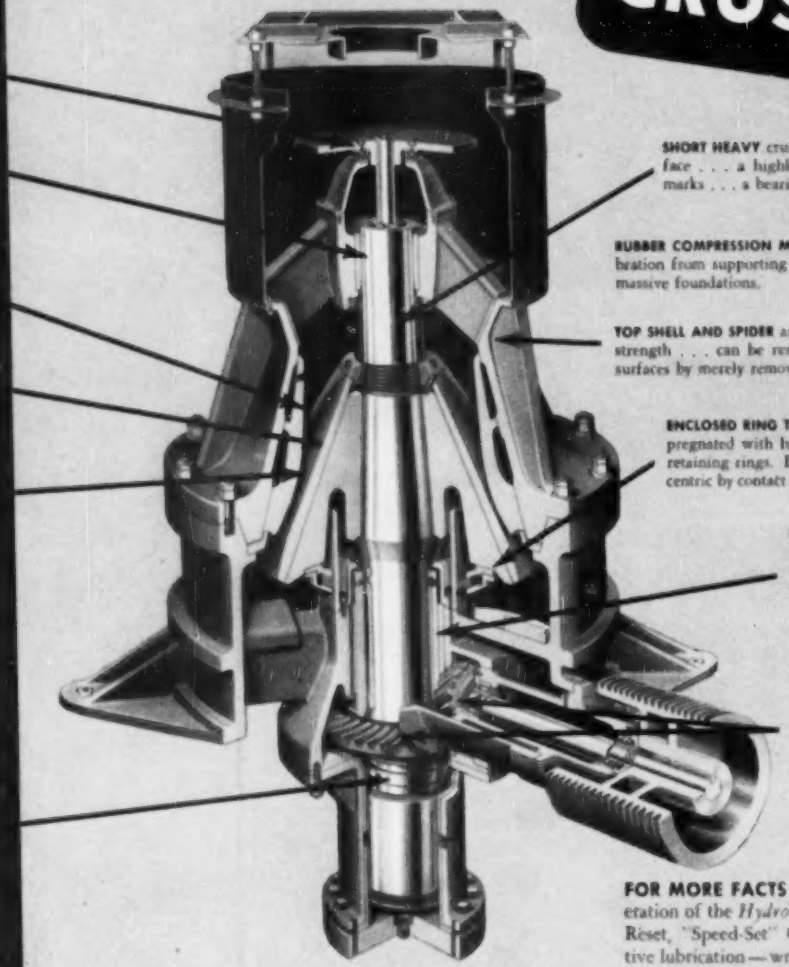
See These A-C Products at Metal Mining Show!

See a Hydrocone crusher in operation—the gyratory crusher described on these pages. See — an operating Ripl-Flo vibrating screen . . . a rubber lined pump . . . a solids handling pump with automatic Texrope drive . . . new motors . . . motor starters . . . a new air break contactor!

American Mining Congress Metal Mining Show
Salt Lake City, August 28-31

Details

HYDROCONE (FORMERLY TYPE R)* CRUSHERS



SHORT HEAVY crusher shaft has "cold-worked" surface . . . a highly polished finish free from tool marks . . . a bearing surface of the highest quality.

RUBBER COMPRESSION MOUNTINGS isolate operational vibration from supporting structure . . . eliminate need for massive foundations.

TOP SHELL AND SPIDER are cast in one piece for maximum strength . . . can be removed easily to replace crushing surfaces by merely removing nuts from joint studs.

ENCLOSED RING TYPE dust seal — a plastic ring impregnated with lubricant and held in place by two retaining rings. Dust is sealed from the crusher eccentric by contact of the plastic ring with dust collar.

BRONZE ECCENTRIC SLEEVE is easily changeable in the field. Various eccentric throws may be obtained through the use of different sleeves . . . again adding to the versatility of the *Hydrocone* crusher.

BEVEL AND PINION GEARS are of the spiral design in the larger sizes . . . provide greater tooth contact and smooth, trouble-free operation under the most severe conditions. Standard design bevel and pinion gears on the smaller sizes.

FOR MORE FACTS about the application and operation of the *Hydrocone* crusher—with Automatic Reset, "Speed-Set" Control and automatic protective lubrication—write direct to Allis-Chalmers for **Bulletins 07B7145A and 07B6006E.**

Hydrocone and *Speed-Set* are Allis-Chalmers trademarks.

*The term "Type R" by which these Allis-Chalmers crushers have been known has been changed to "Hydrocone." Hydro denotes the use of a static liquid, such as oil, used in the Hydrocone crusher for supporting and adjusting the height of the crushing cone. The principle of operation has not been changed.

ALLIS-CHALMERS

For greater **SPEED...**

STABILITY...

SMOOTHER RIDING...

SPRING MOUNTED REAR-DUMP EUCLIDS

This new line of spring mounted Rear-Dump Euclids is designed for greater speed and stability on the haul road and long life in off-the-highway service. Heavy leaf springs are free floating in spring brackets to assure smooth riding and prevent breakage caused by twisting action on rough roads. Axles are positioned to the frame by longitudinal radius rods.

Rear-Dump Euclids with spring mounted drive axles range in capacity from 15 to 34 tons . . . diesel engines to 380 horsepower . . . and have travel speeds up to 32.2 m.p.h. Hydraulic booster steering assures positive control over all road conditions and reduces driver effort on sharp turns and rough hauls.

Built to the same high standards of construction and design that have made "Eucs" the favorite for tough hauling jobs, these improved models provide outstanding performance and lowest cost per ton or yard moved. Your Euclid distributor will be glad to show you how Euclid equipment can help cut your hauling costs and make more profit for you.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

rowing it from the United States, and Britain is anxious to return it to the latter.

INDOCHINA — The Societe d'Etudes et d'Exploitation Miniere de l'Indochine hopes to produce 550 tons of 50 percent tin concentrate in 1950 and 1,200 tons in 1951 at its property at Phoutiou, Laos. Because of internal strife only tin is being mined in North Viet Nam at present, and the Societe will be faced with considerable odds to overcome transportation and labor difficulties caused by Viet Minh raids.

INDIA—A diamond-bearing volcanic pipe has been found near Panna town, central India, by the Geological Mining and Meteorological Society of India. The pipe consists of basic igneous rock in which diamonds have crystallized and occur as a primary mineral, according to the report. The Panna area has been worked for centuries for diamonds from conglomerates, which are of secondary origin, and until now the primary source had never been found.

CEYLON—A kaolin deposit containing an estimated 6,000,000 tons has been found near Colombo and may be developed as raw material for a local chinaware industry.

JAPAN—Through an agreement with Argentina, Japan will ship 4,500 tons of lead slabs valued at about $1,000,000 in return for Argentine cotton. In another agreement now being negotiated Japan will export 4,500 tons of aluminum, or about half its stockpile, to Argentina. Value of this shipment is $1,500,000.

MALAYA—The British Secretary of State for the Colonies, Mr. J. Griffiths, has approved a plan to provide £325,000 for more intensive geological surveying in Malaya with the purpose of locating new tin deposits. Malayan tin mines are closing one by one because of the lack of reserves.

MALAYA—The recent arrival of mining machinery from the United States has resulted in a tremendous increase in Malayan iron-ore production, which totaled 66,162 long tons in the first quarter of 1950 compared with only 8,390 tons in 1949. (In 1939, 1,942,521 long tons were produced.) All except 93 tons of this increase came from the *Bukit Besi* mine in the state of Trengganu. Most of the Malayan production is being sent to Japan.

UTAH—Every department of *Geneva Steel Company*, subsidiary of *United States Steel Company* at Geneva, Utah, set production records in May for the first time in the plant's history. Shipments amounted to 92,000 net tons, exceeding the January

record of 87,502 net tons. Production from open hearth furnaces was 136,455 net tons; rolling mill, plates and hot rolled coils, 87,684 net tons; slab and bloom production, 115,872 net tons. Total blast furnace production was 98,852 net tons; furnace coke, 87,976 net tons; and foundry production, 5,641 net tons.

NEWFOUNDLAND — According to Lionel A. Forsyth, president of *Dominion Steel and Coal Corporation*, German interests have ordered 50,000 tons of Bell Island, Newfoundland, iron ore, the first order the company has had from Germany since pre-war days. The contract was negotiated in London; neither price nor purchasers was announced.

ALASKA—The short mining season is in full swing and among reports received about the activities of various firms and individuals are the following: In the Kobuk and Squirrel River district on Cleary Creek, *Helcolicos Mines* is engaged in drilling and dredging operations using a new three-cubic-foot dredge installed at the beginning of the season. About 20 men are employed and Robert C. Armstrong is president. In the same district *Lammers Exploration* is operating its dredge as usual according to Graham Lammers. At Buck Creek, George and William Ramstad are mining placer tin, using a dragline. At Mammoth Creek in the Circle district the C. J. Berry dredge is being manned by the same crew as last year with Harold Christensen as superintendent.

SASKATCHEWAN—Plant equipment is being installed and a road being built on *Nisto Mines'* property, Black Lake, preparatory to driving an adit about the middle of this month. The company plans to mine throughout the winter, with R. J. Kilgour directing operations. The Main Zone, where diamond drilling indicated the best uranium deposits, should provide sufficient ore from the area above the adit to feed a 75-ton mill for two years. Further surface exploration work in the Main Zone will be done to locate additional ore-shoots.

MICHIGAN — At *Cleveland-Cliffs Iron Company's Mather* mine, Ishpeming, the "A" and "B" shafts, which are 9,000 feet apart, recently were joined by a drift on the sixth level, making the mine the largest underground iron ore mine in the world. Production from the "A" shaft is estimated to be the same this year as the past two years—over 1,000,000 tons of iron ore.

ONTARIO — At Geraldton, *MacLeod-Cockshutt Gold Mines* has installed an additional mill unit and has raised production from 650 to 1,000 tons daily. Successful development of the key "F" zone has made expansion feasible and so far about 29,070 tons of ore has been removed from the 10th level of that zone. Drifting on the 11th level has advanced 700 feet, and on the 9th 500 feet. On each level a

WORLD MINING

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Production Manager . . . E. B. HERINGTON
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Regular correspondents in the following cities and mining centers:

Santiago, Antwerp, Stockholm, Cyprus, Tientsin, San Jose (Costa Rica), Baguio (Philippines), London, Tokyo, Frankfurt, Medellin (Colombia), Strangways (Victoria, Australia), Vancouver, Paris, Bangkok, Mexico City, Helsinki, Tananarive (Madagascar), Redruth (Cornwall), Oslo, Benares (India), Dorsley (Transvaal, South Africa), Budapest, Singapore, Buenos Aires, Lisbon, Madrid, Ankara, Lima, Rome, Sao Paulo.

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good deal of the ore found has been at least average mine grade. In the north sulphide zones on the new 12th level several new oreshoots have been discovered. The company expects to open a 14th level soon in the north zone by sinking an inclined winze.

ONTARIO-QUEBEC — A number of new shaft-sinking projects have been announced or are underway at mines in these provinces and some details of the projects follow: At Kirkland Lake, Ontario, *Kirkland Lake Gold Mining Company* has finished its pilot raise, is extending its No. 4 internal shaft 400 feet and will establish levels at 5,600 and 5,700 feet. *Macassa Mines* at Kirkland Lake is sinking an internal shaft from the 4,625-foot level to the 5,375-foot point and will establish six new levels. The company may even continue sinking to 6,000 feet. The nearby *Lake Shore Mines* has sunk its No. 4 shaft to 7,750 feet and will go to 8,000 feet. The mine remains the deepest on the continent. No lateral work has been done below 6,450 feet. Crosscuts on the 6,825 and 7,325 levels have penetrated the main orebody however. At Geraldton, *Magnet Consolidated Mines* is sinking a winze from the 14th level to open four more levels and lateral work on the first of the levels, the 15th, will begin soon. Milling rate has been increased from 120 to 145 tons daily, and will be increased further if results on the four new levels are satisfactory. At Noranda, Quebec, an internal shaft is being sunk by *Powell Rouyn Gold Mines* from 2,450 feet to 3,000 feet to open four new levels, and mill equipment is being installed to raise the daily rate from the present 450 tons to 625 tons, according to L. M. Keachie, president. In Dupuisson township, *Shawkey (1945) Mines Ltd.* is putting in a new head frame for a 1,000-foot, three-compartment shaft to be sunk about 3,000 feet south of old workings. The mining plant is being moved to this site.

ONTARIO—*New Dickenson Mines* is installing a $100,000 roasting plant at its property at Red Lake with operation scheduled for September. Crushing and grinding equipment already is in operation.

ALASKA—A lode mining company, *Mutual Investors*, has been incorporated at Sitka with a capitalization of $1,500,000. Among the incorporators are Theron J. Cole, Roy A. Evenson, Carl A. Peterson and Theodore A. Harris.

UTAH—For the first time copper ore will be mined, milled, smelted and refined in this state as *Kennecott Copper Corporation* has finished its $16,000,000 refinery at Garfield, and *American Smelting and Refining Company* has completed the anode casting addition to its copper smelter. The refinery's top capacity is 12,000 tons of refined copper monthly in ingot and wire bar form. About 800 workers are necessary to maintain this output.

NEW METHODS—NEW EQUIPMENT

FREE MANUFACTURERS' LITERATURE

HEAVY MEDIA SEPARATION: A new 16-page booklet illustrates and describes WEMCO equipment for heavy media separation, cone separators, drums separators, dewaters, thickeners, and auxiliary equipment used in the process. Specify bulletin P-11-S-1, which discusses principles, application, construction and operation, when writing to MINING WORLD.

MOBIL-MILLS: In four pages and two colors, a new booklet describes application, construction and design, size availability, operating results, and advantages of the WEMCO Mobil-Mill for heavy media separation. Write to MINING WORLD for Bulletin No. M-3-M-3, WKE Mobil-Mill.

DIESELS: A new 16-page illustrated booklet contains complete information on Caterpillar's latest and most powerful Diesel engines, models D397, D386, D375, and D364; it covers outstanding advantages and qualities, and is complete with specification and performance charts. Copies of this pamphlet may be obtained by writing MINING WORLD and requesting Form 12725.

FLEXIBLE RUBBER PIPE: A newly issued, 8-page bulletin explains the application of Hewitt-Robins Flexible Rubber Pipe, compares it with metal pipe for short-flow lines, and demonstrates its economies of installation, maintenance and long life. Bulletin No. H-1, which also contains case histories and a list of recommended applications, will be sent to all readers who request it from MINING WORLD, 121 Second St., San Francisco, Calif.

GEIGERS: The Model 103 Prospectometer for use in light aircraft, and the model 103-C Prospectoscope for use in planes, trucks and other noisy locations are now in production by the Radiac Co. of New York. Specify Radiac Prospectometer or Radiac Prospectoscope for your further information from MINING WORLD, 121 Second St., San Francisco, Calif.

UNITIZED BELT-CONVEYER HEAD PULLEY: A 19-page brochure with photographic illustrations has been prepared by J. D. Christian Engineers to describe the Power Packaged Terminal (PPT), a unitized belt-conveyor head pulley in which the motor and gear-reduction unit are enclosed within the pulley cylinder. Brochure No. 402, which lists the 14 available standard sizes, may be obtained by a request from MINING WORLD.

DIESEL: Users who need neither a high-speed automotive diesel nor a heavy, slow-speed, de-rated engine will be interested in the 6- or 8-cylinder in-line series of TS diesels now being produced by the Ingersoll-Rand Company. Additional information on this unit, which delivers 195-375 hp. at 800-1,000 rpm., can be obtained by writing for Ingersoll-Rand TS Diesel Data, MINING WORLD.

COMPRESSORS: XLE unitized, electric-driven air compressors embody a new L-shaped design and are being produced in 125-350-hp. sizes for two stage compression to 80-125 psi. Additional information on the compact new unit will be sent to those who request Ingersoll-Rand XLE Compressor Data, MINING WORLD.

ROTATING EQUIPMENT: A new 24-page booklet contains a series of articles written by Fraser Jeffrey, assistant to Allis-Chalmers' chief electrical engineer, who authoritatively describes preventive maintenance and machine repair of electrical machines. Copies of "Care of AC Rotating Equipment," O5R7417, are available upon request from MINING WORLD.

REBUILDING WORN TRACTOR PARTS: Use of 11% to 13½% Manganal-Nickel Steel products for repairing and rebuilding drive sprockets, idler wheels, track rollers, bulldozer blades, and other tractor parts is described in a new folder issued by the Stulz-Sickles Co. Methods for making these repairs quickly and economically with Manganal Applicator Bars and Welding Electrodes are described in "Rebuild Worn Tractor Parts," available now upon request from MINING WORLD, 121 Second St., San Francisco, Calif.

Copies of all bulletins may be obtained by writing MINING WORLD, *121 Second St., San Francisco 4, Calif. Please refer to bulletin number and issue in which it appeared.*

Cummins Will Produce Standard Generator Units

Production of a standard commercial line of Cummins Diesel-powered electric generator units is announced by Cummins Engine Company, Inc., of Columbus, Ind.

Sixty-cycle units are available in 40, 50, 60, 75, 100, 125, 200 and 250 kilowatt ratings. Similar units are also available for 50-cycle operation at a slight derating in KW capacity.

These Diesel generator units are designed for continuous service applications where the unit is the primary source of power. Their instant starting and high availability characteristics also make them excellent standby or emergency sources of power.

Optional equipment offered by Cummins for the various generator units includes automatic overspeed shut-down control; automatic high temperature and low lubricating oil pressure shut-down; complete marine-type or radiator-type cooling systems; hydraulic governor; water-cooled exhaust manifold; and generator mounted package control unit. Special generator voltages and KW ratings are also available.

Super D Tournadozer Meets Need for Smaller Jobs

To meet the need for a speedy, rubber-tired, four-wheeled tractor dozer to handle jobs which do not demand the use of the larger, standard size Tournadozer, R. G. LeTourneau, Inc., Peoria, Illinois, manufacturer of earthmoving and construction equipment, has introduced the smaller size Model Super D Tournadozer.

Some 3,500 pounds lighter and equipped with a smaller capacity bowl than the Super C Tournadozer, the Super D is powered by a 122 hp. Diesel engine. Capacity of the Super D's bowl is 1.8 yards. . . . the Super C's capacity is 2.5 yds. The smaller model Tournadozer retains the advantage of high speed, having four speeds forward up to 19 m.p.h., with two reverse speeds.

New dump truck has 28 cubic yard body.

Heil Builds World's Largest Dump Body

What is believed to be the world's biggest dump truck has recently been completed by The Heil Company, Milwaukee, and delivered to Pennsylvania for a coal mine operation.

The huge 28 cubic yard body has a full cab protector and is activated by a Heil 2040 double-acting, single-link, twin-arm hoist, capable of raising and dumping a full load in 20 seconds. It is mounted on a specially built, six-wheeled Sterling chassis with 163-inch wheelbase, 325 horsepower Diesel engine and chain drive. Road speed on overdrive is 32 miles an hour.

The Goliath on wheels weighs 35 tons, empty, will be used to carry coal and overburden in strip mining and will be closely checked for performance advantages in competition with standard, smaller sized units.

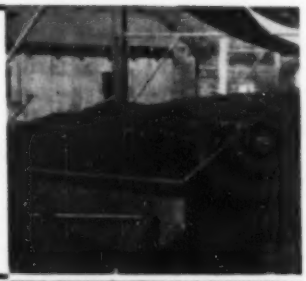
THE S-D "FLOATER"...

America's No. 1 Mine Car Wheel!

"FLOATERS"

FOR FASTER . . . CHEAPER HAULING

Independent engineering firm tests prove that locomotives can pull up to 50% greater loads with no additional power requirement when cars are equipped with S-D "Floaters" instead of other types of precision bearing wheels . . . a big power and time saver!



"FLOATERS"

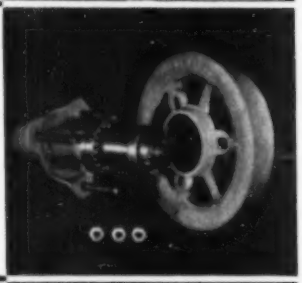
FOR LESS MAINTENANCE . . .

With "Floater's" solid closed front hub, and back double seal, grease stays in the wheel, dust and dirt stay out. Often "Floaters" require greasing no more than once in five years.

"FLOATERS"

FOR QUICK DEMOUNTABILITY

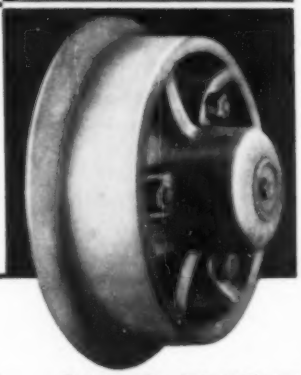
Any unskilled worker can remove and replace a "Floater" as easily as changing an automobile wheel. Bearings always remain in perfect adjustment on axle. When replaced there's no chance of pinching, misalignment, loose or tight bearings.



"FLOATERS"

FOR LONGER WHEEL LIFE

We believe our own special mixture of iron and exclusive heat treatment are responsible for making "Floaters" famous for their toughness and long wear . . . such quality is your assurance of perfect satisfaction.



Try S-D "Floaters". Check their savings. Experience proves that once an operator knows what "Floaters" will do for him, he specifies smooth-running "Floaters" for all wheel replacements. For complete information, write Sanford-Day Iron Works, Knoxville, Tenn.

SANFORD-DAY IRON WORKS

precipitates—CENTRAL and EASTERN

IRON POWDER PROJECT AT AURORA, MINNESOTA, TO END AUGUST; LABELED UNSUCCESSFUL

Continental Machines, Inc., has announced that it has completed experimental work at the $650,000 state-owned iron powder plant at Aurora, Minnesota, and is dissatisfied with the results of its extensive experiments.

J. Wilkie, president of Continental, notified Ben F. Constantine, Iron Range Resources Commissioner, that the "Firth process" (named for the late Charles V. Firth of the mines experiment station of the University of Minnesota and designed to produce iron powder profitably from taconite which is high in iron carbonate and iron silicates) would not work profitably in this instance, although the work done had advanced the cause. Wilkie added that "in spite of the progress which we have made in improving the Firth vertical-shaft furnace and in redesigning and rebuilding it completely, we have not produced—and we are now satisfied that we cannot produce—iron powder by this process on a commercially-feasible basis."

Continental Machines, Inc., was given the job of constructing and operating the plant in February, 1945. Commissioner Constantine said that "the fact that Continental has concluded its experimental work without success does not necessarily mean that we have found all the answers to the problems offered in trying to determine whether iron powder can be profitably or commercially produced from taconite high in iron carbonate and iron silicates. The picture may be quite the contrary." Continental is discontinuing its operations on August 31. In the meantime, the Iron Range Resources Commission expects to appoint a commission of competent chemical and metallurgical engineers to study the possibilities of developing low grade ores in northern Minnesota by utilizing the Aurora plant.

A bill was passed at the last session of the state legislature appropriating an additional $116,311 to keep the Aurora plant open for experimental work. This amount will increase the total funds appropriated to $766,311.

CENTRAL STATES

Edgar Keith and William York are developing a deposit of zinc blende in the Turkey Creek valley, north of Joplin, Missouri, and have excavated a trench about 300 feet long and 30 feet deep. The depth of the deposit is estimated at 40 feet with 10 feet of overburden. Estimates of reserves are incomplete. Ore is mined by a ⅜-yard Lorrain shovel and is hauled by two Ford trucks to the St. Louis Mining and Milling Company's mill, 2½ miles away. The men expect to mine about 150 tons per day when development is further along.

The Fall Regional Meeting of the Industrial Minerals Division, A.I.M.E., is to be held at Norman, Oklahoma, October 17-20. Host for the meeting will be the Oklahoma Geological Survey; Dr. Robert H. Dott, director of the Survey, is chairman of the local committee.

The *J. E. Carter Mining Company* and the *Superior Mining Company* shortly will place in operation a jointly-owned new, modern mill at Mineral Point, Missouri. The mill will grind the company's crude production of barite for an oil well drilling mud additive and will handle about 125 tons daily. The opinion is that ground barite will find a readier market than crude.

Rehabilitation is underway on another of *Quincy Mining Company's* idle reverberatory furnaces at the copper smelting plant, Hancock, Michigan. The new equipment will allow for a continuous casting method and 125,000 pounds of copper will be yielded per charge.

EASTERN STATES

Prospectors have revealed the discovery of manganese deposits near Lebanon in Russell County, Virginia. The report also stated that samples tested so far were of definite commercial grade.

The $2,500,000 expansion of the Baltimore, Maryland, titanium dioxide plant of the *Glidden Company's* Chemical and Pigment Division now is well under way according to Dwight P. Joyce, president. Completion of the work will permit a 90 percent increase in the company's production of titanium dioxide and will raise the annual output of pigment to 18,000 to 20,000 tons. Ilmenite for the titanium dioxide is extracted from Glidden's Lenoir, North Carolina, mines and from the huge deposit at Allard Lake in Canada.

The best 1949 safety record in the underground metal mine group was made by the Mascot, Tennessee, mine of the American Zinc Company, a

PACIFIC ISLE BUSY AT SEVERAL MINES

The Pacific Isle Mining Company of Hibbing, Minnesota, is mining and stripping at the York mine at Nashwauk (formerly operated by Coates and Tweed); mining and developing at the Lamberton mine, west of Hibbing; diamond drilling near Randall in Morrison County; and will mine and develop the ore in the old Croxton mine near Buhl for the Hedman Mining Company. All the properties are iron producers. Seen above is the Heavy-Media Separation Mobil-Mill located near Hibbing, and used to treat company ores. Also seen in the picture are the tailings stacker, railroad ore receiving bin, truck receiving bin, crushing, screening and fine ore separation circuits, and two of the company's 20-ton Cummins diesel-powered Euclid trucks.

subsidiary of the American Zinc, Lead and Smelting Company of St. Louis. The mine participated in the 1949 National Safety Competition of the U. S. Department of the Interior, Bureau of Mines, and won the Bureau's "Sentinels of Safety" trophy for not having a single lost-time injury to an employee during a total work time of 410,051 man-hours of work, according to James Boyd, Bureau director.

The New England Council announced that its steel committee voted unanimously that New London, Connecticut, be the site of a proposed $225,000,000 steel mill, and the six states involved appeared to favor the decision as wholeheartedly. A survey of the New London area will be conducted by the New England Steel Development Corporation, one of the committee's agencies, and a special advisory committee named by Governor Bowles of Connecticut. The state also has voted $60,000 to be spent on the survey. One reason that New London was picked as a site was its proximity to New York and New Jersey steel markets.

A 36-acre tract of Mobile River property has been bought by the *Tennessee Coal, Iron and Railroad Company* in Mobile, Alabama. The company, a subsidiary of the *U. S. Steel Corporation*, will develop and improve the property as a terminal to handle imports of foreign ore used at company steel plants near Birmingham, according to Robert Gregg, president. The scope and type of improvements are closely contingent on U. S. Steel's iron ore developments in Venezuela, he said.

IRON RANGES

Jones & Laughlin Ore Company will start shaft-sinking at the *Tracy* mine, Negaunee, Michigan, in the fall, according to Harry S. Peterson, general superintendent. First shipments will begin sometime in 1954 and about a million tons of iron ore will be shipped annually.

The *Erie Mining Company* made an initial shipment of taconite pellets in early June from its *Aurora* plant to the *Zenith* furnace of the *Lakeside Iron Corporation* at Duluth, Minnesota. Thorough tests of the pellets will be made during the summer as about 10,000 tons will be shipped.

Stripping is continuing at *Inter-State Iron Company's Schley* mine, Gilbert, Minnesota, and regular production is expected in 1951. The Schley was operated formerly as an underground mine by *Republic Steel Corporation*. A new screening and washing plant will be built in time for the 1951 shipping season.

Skubic Brothers will have a sufficient amount of stripping removed so that the *Ajax* mine at Biwabik, Minnesota, will ship ore this season.

Oglebay, Norton & Company has announced that it will re-open the *St. James* mine at Aurora, Minnesota, for the *St. James Mining Company*, fee owners. The mine will be a shovel-truck operation. The last shipment from the property was in 1924—519,210 tons—when it was operated by the *Corrigan-McKinney Steel Company*. Shipments to date have been 2,680,830 tons, and an estimated tonnage of 3,928,000 tons remains available. Barney Knudsen will be superintendent of the mine and Frank J. Smith of Ramsey, Michigan, is iron range manager of mines for Oglebay, Norton.

The shaft which *Pickands Mather & Company* will put down at the *Ironton* mine, Bessemer, on the Gogebic range of Michigan, eventually may reach 4,000 feet in depth. Pickands Mather will operate the mine for *Youngstown Sheet & Tube Company* and *Bethlehem Steel Company*. The Ironton originally was opened in 1886, and the new shaft is expected to develop an extensive orebody. Later this year, Pickands Mather will take over the *Eureka* mine shaft from the *Castile Mining Company* in order to handle ore originally intended for the *Anvil* mine shaft which is steam equipped, while the Eureka is electric.

precipitates—SOUTHWEST

ARIZONA'S ARAVAIPA DISTRICT EXEMPLIFIES THE EFFECTS OF HIGHER LEAD-ZINC-COPPER PRICES

In recent weeks a renewed interest in mining has been noted in the Aravaipa district, near Klondyke, Arizona. The upsurge is credited to the higher prices for lead, zinc and copper; the hopes for electric power in the near future; and the possibility of a custom mill to treat low-grade ore. Among the mines in the district reflecting the increased activity are the following:

The Athletic Mining and Smelting Company of Ft. Smith, Arkansas, the largest operator in the district, is now working three mines, namely, the Head Center, Grand Central, and Iron Cap. Two round trips daily are made to the railroad siding at Cork, near Pima, Arizona, by three eight-ton ore trucks with a total of approximately 50 tons of high-grade lead ore. In addition, the Iron Cap is being prepared to furnish mill ore to the company's 120-ton concentrator. This plant, which currently is operating only two days a week, produces a lead-zinc concentrate. When production at the Iron Cap is under way, plans call for the treatment of 100 tons of milling ore daily. The company recently purchased an Eimco No. 12 mucking machine to step up production. At present the operating crew consists of 20 men, but this number is expected to be doubled in July. Harvie L. Horton, Box 792, Safford, is general manager.

Another producer is the Ben Hur Mining Company, organized by local merchants at Klondyke. This company has leased the Landsman Shaft, including 13 mining claims, and is making shipments of lead ore from the 60-foot level to the American Smelting and Refining Company's smelter at El Paso, Texas. The ore is hauled to the railroad siding at Cork by Pete Baily. Ralph Henderson of Miami, is mine foreman. The Landsman Shaft was sunk by Frank Landsman in 1939.

In the north end of the district is the Abe Reed mine, operated by William Reed. He has shipped three cars of lead-silver ore.

One mile south of the Abe Reed is a new property, the Fairview, owned by Charles Bush and Paul Merrill. Five carloads of lead-silver-gold ore have been shipped in recent weeks from this mine. According to reports the vein, which was 10 inches wide at the surface, has widened to three feet at the 120-foot level. A 90-foot drift has been run south on the vein and two stopes opened. A new modern mine hoist is being installed. Charles Sammis of Safford is the mine foreman.

The Sein Fein mine of Harwood, Inc., has been leased on a royalty basis to the Nicholson interests of Nevada. It is said to lie on the same vein formation as the Head Center and Grand Central mines, and to have produced 30 carloads of lead, silver, and gold ore in previous operations directed by Ray Pointer as superintendent.

California parties have leased on a royalty basis the 23 zinc-lead-silver claims lying east and south of the Iron Cap and owned by Frank Landsman. Lawrence Spring is representing the new interests at the mine.

West of the Fairview is the Last Chance lead-silver mine (the old Orejana) which has been leased to Stewart of Globe. He is building a road to the mine so that prospecting machinery can be taken in to the mine.

Other claims in the district include the Bush mine, to the west of the Grand Central, developed by a 100-foot shaft, and the Brushy-Dale group. The latter is centrally located and has the double advantages of a good road and camp site, together with operating water. It is owned by Bott and Sons.

Meanwhile engineers for the Rural Electrification Administration, through the Graham County Electric Cooperative, have been surveying for the power line to be run down Aravaipa Valley to connect Hooker's Ranch, Klondyke, Aravaipa, and Bonita with the Pima and Cochise plants.

If such power projects, plus road building programs and sustained higher prices can cause favorable results in the Aravaipa district and can go into effect elsewhere, the small mine operators may revive again.

Uranium-vanadium deposits in the Lukachukau Mountains, Apache County, Arizona, are being developed by F. A. Sitton of Dove Creek, Colorado. Development results are reported so favorable that construction of a new mill at Shiprock, New Mexico, to process the ore is under con-

NATOMAS DREDGES IN NEVADA

Natomas Company, a California firm, is using the above bucket-line dredge at its Grosean Placer operation near Battle Mountain, Nevada. The property was exhausted of dragline possibilities last year and the new dredge, designed for deep-dredging, was installed thereafter and began operating in August. During the year 1949 the company had five dredges at work in the Folsom, California, area. A sixth dredge in the same area is in the process of being moved about 12 miles from its original site and should be operating again before the end of this year. A seventh dredge was returned to operation in November of 1949 after a shutdown of a year and a half. The combined operation of all dredges resulted in 24,901,321 cu. yds. of gravel dredged in the year with a net profit for the company combined with its subsidiary, the Natomas Water Company, of $752,679.53 before Federal income taxes.

sideration. The AEC is sending engineers and geologists to the area for further investigations.

Sale of the titanium claims of the *Bi-Metals Group* has been reported by J. H. Dungan, Kingman, Arizona. The purchaser is an eastern chemical and paint manufacturer. According to Dungan, $15,000 has been placed in escrow to cover the cost of preliminary diamond drilling to prove the value of the claims. Dungan describes the ore as "ilmenite from which titanium is extracted."

The *Camp B Mining Company*, Wickenburg, Arizona, has completed sinking and timbering its shaft to the 400-foot level and is driving a 90-foot crosscut on that level. At a recent stockholders' meeting the management was authorized to sink the shaft an additional 100 feet, to the 500 level. Seven men are employed on a two-shift basis. The Camp B holdings consist of nine claims in the Blue Tank district, 11 miles northeast of Wickenburg on the Constellation road. Officials of the company include Emmet Nutter, president and manager, Wickenburg; Hollis B. Gray, secretary-treasurer; and John Perkins and Lloyd C. Miller, vice-presidents; J. D. Keeman is superintendent.

A small crew is employed by *Upshot Mines, Inc.*, in deepening the present 210-foot shaft an additional 100 feet. The company is developing a group of claims in the Big Bug district of Yavapai County, one and one-half miles north of Mayer, Arizona. At the annual meeting of stockholders the following officers were elected: Omar D. Smith, president; D. H. Wachtel, vice-president; Clarence E. Ekroth, secretary-treasurer; and A. Sullivan, Harry T. Lindley, and Henry C. Firman, members of the board. Company offices are located in the Valley National Bank Building, Prescott.

Willow Valley Mines at Deer Creek, Nevada City, California is reopening the old *Bellfontaine* mine shaft, installing electric power, and extending the 400-foot level toward possible extensions of the *LeCompton* and *Posey* mines' gold veins, from which substantial amounts of ore have been taken in the past. Willow Valley holds 16 claims acquired from *Valley Gold Mines, Inc.* According to John M. Hoff, president and general manager of Willow Valley, the company will work these three mines only and lease the others on the property.

The *Homestake Mining Company* resumed milling operations about June 1 in its 100-ton, all-slime cyanide plant at Winterhaven, Imperial County, California. The mill has been

completely rebuilt and revamped following the destructive fire in 1947 and steel and concrete construction have been used extensively to minimize the fire hazard. The company is working the *Cargo Muchacho, Padre* and *Madre* mines in the Cargo Muchacho Mountains. Kenneth A. Holmes of Yuma, Arizona, is president of the company and in direct charge of operations. Les Hardy, Yuma, is superintendent.

Several Oakland mining men have leased the Western Manganese Mines property at Crescent Mills, Plumas County, California, and hope to get the property in full production before long. The men leased the property from owners Myles Timmons, Charles Herring and Helen Bear of Crescent Mills, who produced ore from the mine last year but of recent months it has been closed. Complete surveying is underway and a crew will be moved in shortly.

NEVADA

Newmont Mining Corporation is driving a 1,000-foot crosscut adit as the first phase of its exploration of the Candelaria silver-gold district 25 miles south of Mina, Nevada. Camp buildings are under construction and machinery, including a large Ingersoll-Rand compressor and an Eimco mucking machine, has been installed. Harry Miller and associates have the tunnel contract.

Pacific Butte Mines Company has struck silver-lead-gold ore at its mine at Montezuma, Nevada. The ore was found in a winze 18 feet below the main tunnel level of the *Eve* claim and has been followed for 30 feet. Mining and shipping ore to the smelters has begun.

Paramount Mining and Milling Corporation has leased the Quinn mill at Goldfield, Nevada and will re-equip it and expand its capacity to 100 tons daily, according to reports. The mill will be used for custom milling. Purchasers are O. E. Walling, Bob Borneman, Wayne Hawkins, Bob Fisher, Leo Johnson, Glen Fisher and Ted Siebert.

E. Morrison Booth, owner of the Cimarron properties 16 miles northwest of Tonopah, Nevada, announces that a surface plant is being set up in preparation for a prospecting and development program. The gold-silver vein system at the Cimarron is a series of fissures which cross an andesite dike approximately 200 feet wide. The gold-to-silver ratio averages about seven to one. The shaft at present is down to the 117-foot level, from which point the vein has been drifted on for 160 feet. A winze has been sunk 87 feet from the 117-foot level. To begin the new exploration program, a crosscut will be driven approximately 400 feet to connect with the drift on the 117-foot level. Booth, who discovered the claim and has worked it for 15 years, has negotiated an operating agreement with Edward R. Hines. The property is now under lease and bond to Hines who represents Chicago interests.

A new barium property 15 miles southwest of Winnemucca in Humboldt County, Nevada, is being tested for operation by several companies and eventually will be opened, according to Jack Tomlinson of Winnemucca, who has staked the land with his partners, J. M. Mullinix and Lloyd Mullinix. About 10,000 to 15,000 tons of ore is estimated to exist in the deposits.

Tonopah North Star Tunnel and Development Company has reopened the *Antelope Springs* mine, Imlay, Nevada, according to J. E. Bottomley, superintendent. Ore is predominately zinc with some lead, silver, copper, and gold. At present the sulphide ores are being shipped to the *International Smelting and Refining Company's* Tooele, Utah, plant and the oxide ores are used to backfill stopes and held in reserve until a mill can be constructed at the property. Gus Rogers of Winnemucca and Mrs. Margaret Geiger of Fresno, California, own the mine.

NEW MEXICO

The labor strike has ended at *American Smelting and Refining Company's Groundhog* unit at Vanadium, New Mexico, and operations have been resumed. The strike began May 9 but the property has not produced since last summer when it closed after the drop in lead and zinc prices.

Production has been resumed from the *Oswaldo No. 1* zinc mine of *Kennecott Copper Corporation*, Santa Rita, New Mexico. The *Oswaldo No. 2* shaft is being prepared for production. Work is under way to connect these two mines and should be completed almost immediately.

Erection of the $4 to $5,000,000 surface plant on *Duval Sulphur and Potash Company's* property near Carlsbad, New Mexico, is under way with Stearns-Roger Manufacturing Company doing the work. The two shafts which Utah Construction Company is sinking for the company are both down below 60 feet and in good ground. The Carlsbad region contains many million tons of potash.

A great deal of activity is being directed toward the production of mica from the deposits of Rio Arriba and San Miguel counties, New Mexico. An increase in demand has brought mica buyers out with better prices and probably New Mexico mica will move to markets shortly.

precipitates—ROCKY MOUNTAIN

Numerous Claims Acquired By New Colorado Firm

A new company, Gold Uranium Corporation, successor to The North American Mining Company, which in turn was the successor to the Big Five Mining Company, has accumulated large groups of patented mining claims in Gilpin, Clear Creek, Boulder and San Juan counties, comprising one of the largest groups of inactive mines in Colorado.

These holdings include the Central Tunnel, which runs north from Idaho Springs for a distance of 1.8 miles, and, connected to the tunnel, the one-time famous mines: Edgar, Fulton, Crystal Hudson, Bald Eagle, Belman and Dove's Nest. As reported before, the company also has acquired by lease and option the Argo Tunnel and numerous adjacent mines.

Several of the mines leased or purchased outright in Gilpin, Boulder and San Juan counties are reported to contain pitchblende in addition to gold, silver, copper, lead, and zinc.

George S. Groves of Montclair, New Jersey, is company president; Harry H. Hahn and Harry Lee Hahn, both of Baltimore, Maryland, are vice-presidents and secretary respectively; and Dr. G. C. Ridland is company engineer.

COLORADO

John Hamm, president of the *Crystal Hill Mining Company*, reports that the first openpit gold mining operation in the San Luis Valley is progressing satisfactorily and the company is mining and processing 500 tons of ore daily. The property is located 20 miles northwest of Center, Colorado. Although previous mining in the region has been underground, the openpit method has been employed by Crystal Hill because of the large quantities of low grade ore in shallow deposits that now can be mined and processed economically.

Work on the new *Golden Cycle Corporation* Carlton mill at Cripple Creek, Colorado, progresses. The installation of a 14-ton Holland crusher has been completed. Five of the large settling tanks on the lowest terrace are in place and work has been started on the sixth, and last terrace. The work on the large tanks on the other levels of the mill also is progressing. According to Robert Welch, a night shift of welders has started to work to complete the steel tanks. There are approximately 165 men employed for the construction work at the present time, and more men will be added as work progresses.

Victor Porter, who has leased the *Mill No. 2* uranium mine at Uravan, Colorado, is doing development work in this newly developed district. An inclined shaft has been driven on a 30-degree angle and carried 5 by 7 feet in the clear and is at present 260 feet long. The shaft is expected to be 295 feet long when completed and ore contact made at this point.

HAROLD S. WORCESTER of Telluride, Colorado, has been made director and assistant general manager of the Golden Cycle Corporation, according to an announcement made by Merrill E. Shoup, president. Worcester is also vice-president of the Colorado Mining Association and a member of the Colorado State Metal Mining Fund Board. Shoup announced other personnel changes, which follow the death of S. H. Bebee, who was vice-president and general manager of the corporation for 12 years. Max W. Bowen takes Bebee's place; C. H. Carlton becomes mining manager; and John Jacobs, Jr., of Colorado Springs becomes comptroller.

At Ouray, Colorado, the *Idarado Mining Company*, mining the Black Bear vein through the Treasury Tunnel, has increased mill tonnage. Gold, silver, zinc, lead, and copper output is reported to have risen because of the higher average grade of ore milled. The company is now stoping on the Black Bear vein's upper levels, developed years ago through the Black Bear shaft. A raise has been driven from Treasury Tunnel level to the bottom of the shaft. Oscar Johnson of Denver is president of this Newmont Mining Corporation operation; Fred Wise of Ouray is general manager; and 220 men currently are employed.

Continued diamond drilling and crosscutting below the 4,000-foot haulage crosscut is reported from the *Pennsylvania Project* at Alma, Colorado. Harvey L. Tedrow is directing this exploration project in Pennsylvania Mountain along the south end of the famous London fault.

Mining engineers from the Region IV office of the U. S. Bureau of Mines have been investigating narrow-vein mines in the Georgetown-Silver Plume district of Colorado in view of the possible selection of a mine in which to conduct a series of narrow-vein mining studies. It is hoped that methods and equipment can be devised to increase man-shift ore tonnage, speed up ore extraction and lower costs.

Diamond drilling at the *Brown Derby* mine on Ohio Creek in Gunnison County, Colorado, has been started by the U. S. Bureau of Mines. During the last war the *Hayden Mining Company* operated the mine producing microlite, lepidolite, and beryl.

The firm of *Harry Scott & Associates*, Englewood, Colorado, is engaged in surface trenching, preparing to develop manganese-bearing mining claims west of Sapinero in Gunnison County.

The *Treasure Mountain Gold Mining Company* has resumed operations at Silverton, Colorado, after the normal winter shut-down. Open-pit mining of gold-silver-lead-zinc ore from the Scotia vein will be carried on during the summer months. Guy Emerson of Denver is president, and E. R. Abadie is in charge at Silverton.

Front Range Mines, Inc., is operating its new mill at Dumont, Colorado, according to John Deersken, president, and is running ore through the plant from its *Strong*, *Mary Cashen*, and *Melvina* mines. The company also will begin accepting custom ore soon to bring the mill up to its 200-ton-per-day capacity.

Perlite Mines Company, a new firm, has optioned perlite deposits in both Colorado and New Mexico and expects to be in production by September 1. The company intends, however, to act chiefly as a marketing agent for perlite. The main office is in the Equitable Building, Denver, Colorado. Officers are: Roy Best, Bernard L. Teets, Roy Burkett, Curtis P. Ritchie, Horace E. Gibson, and John E. Scott, all directors. Best, Burkett and Ritchie were the incorporators.

Vitro Manufacturing Company has been split into a ceramics and a uranium division. The uranium division will supervise the building of a plant costing about $500,000 at Grand Junction, Colorado, and possibly another plant at Marysvale, Utah. The company's first uranium plant, built in 1949, is in Canonsburg, Pennsylvania. A. J. Strod, former chairman of the board has been made president of the uranium division. Herbert Fleck, Vitro vice-president, will manage the Canonsburg plant.

UTAH

Uranium ore is being mined at the old *Silver Reef* property at Leeds, Utah. The mine is owned by Alex Colbath and substantial amounts of silver were produced some years ago by the *Silver Reef Consolidated Mines Company*. Now Colbath has leased several claims to uranium miners, among them Frank M. Willis of the U. S. Bureau of Mines. He shipped the first lot—20 tons—of carnotite-bearing ore in April from several deposits he has located.

New Park Mining Company has leased about two square miles of land in the Marysvale, Utah, area, has located eight claims and will start exploration for uranium if preliminary surveys warrant it. W. H. H. Cranmer, president and general manager, made the announcement. New Park also has acquired all the capital stock, property and claims of the *General Connor Mining Company* in the Park City district by buying out the controlling interest which was held by the *Newmont Exploration Company, Ltd.*, Bernard Baruch, and *Olin Industries*. Exploration for lead, zinc, and silver has been conducted on the property for two years without finding an orebody although worthwhile geological and structural information was secured. New Park will do further geological work in the southern section and will utilize the Cunningham tunnel for exploration of New Park property and for drainage purposes.

WYOMING

A busy program of construction and mining is in progress at *Sunlight Basin Mining Company's* property near Lovell, Wyoming. The property is developed by more than 20 miles of roads to the various tunnels. About 15 to 20 cabins, a warehouse and other buildings are being built now and a mill will be constructed eventually. One tunnel is being worked at present for galena and hornsilver values. The company expects to produce about 60 tons of ore per week and will ship it to AS&R's Midvale, Utah, smelter. During the summer three more tunnels will be driven deeper, two toward gold, silver and copper veins and one to galena and hornsilver veins. Homer S. Hardee is president of the company and George Alderdice is vice president.

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The amazing *purple* oil is now better than ever! With even greater alkaline reserve, oxidation resistance, detergency and other upgraded qualities, the *new* T5X surpasses the exacting standards of U. S. Army Specification 2-104B, Supplement 1.

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Powerful *new* additives have been compounded with a high VI, pure 100% paraffin base to form this *new* T5X. And its improved quality is so high that this great oil is recommended for *any* internal combustion engine operating under *severe* conditions.

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Field tests made by outside companies under critical operating conditions have *also* proved the amazing stability and performance of the *new* T5X in all types of equipment—including trucks, tractors, construction equipment, marine engines and varied types of stationary engines.

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For full information about the new T5X, call your Union Oil Representative. Or write, wire or call Sales Dept., Union Oil Co., Los Angeles 17, Calif.

76 UNION OIL COMPANY OF CALIFORNIA

precipitates—NORTHWEST

AS&R Acquires Stevens County Property

American Smelting and Refining Company has acquired the Willow Creek Mines' Van Stone property, 10 miles south of Northport, Stevens County, Washington, according to J. E. Berg, general manager of AS&R. Several adjoining properties also have been leased and will be diamond drilled under the direction of A. M. Mastrovich, resident engineer.

The Van Stone property consists of 14 claims in two groups beside Onion Creek and is primarily a lead-zinc prospect although some gold and silver exist. The mine has been idle since the 1930's.

The company is the latest of several big mining firms to acquire an interest in Stevens County properties.

Nancy Lee Plans Further Mine Development

Nancy Lee Mines, Inc., Superior, Montana, is planning to develop the lowest level in its King and Queen group of claims. This section of the mine has been under lease for six years to E. G. Smith of Osburn, Idaho, who operated under the name of Nancy Lee Lease. Smith's remaining leases and his 125-ton flotation mill and equipment may be taken over by Nancy Lee Mines later on. Smith would be repayed over a period of years with a percentage of mine profits.

The company's immediate plans are to rehabilitate the lower crosscut adit and extend it to a point below a 400-foot oreshoot developed by Smith on the level above. When the crosscut has cut through the vein on the lower level the two levels will be connected by a raise.

Silver, lead, copper, and gold are the principal values mined, and a good-sized orebody is expected to be encountered when the present project is completed. Frank Eichelberger is manager and consulting engineer.

Coeur d'Alene Mines to Sink 600-foot Winze

A vertical, three-compartment, offset winze will be sunk by Coeur d'Alene Mines Corporation, Osburn, Idaho, at a point west of the 2,800-level south crosscut, about 1,200 feet south of the main shaft, and 100 feet north of the Mineral Point fault, Dr. H. C. Mowery, president, has announced. The winze will be 600 feet deep and will be bottomed at the 3,400-foot level between the Siderite and North veins. These veins have shown very slight silver values on the 2,800 level, but are expected to be richer at depth, as many other veins in mines in the area have been.

The company is continuing to develop the west drift on the Commodore Truxton vein on the 2,800 level leading into Merger Mines ground, and the south crosscut, off which a drift recently cut a well-mineralized structure that will be diamond drilled above and below the level.

Several plants are being installed in Idaho at present. *Sun Valley Lead-Silver Mines, Inc.*, and *Triumph Mining Company* are installing mills at their properties in the Hailey area. Sun Valley's mill is a 125-ton concentrating unit. The company has taken a lease and option on the *Sunday* mine, a lead, silver, zinc, and gold producer, where an estimated 200,000 tons of milling ore exists in the dumps and several thousand more tons in old stopes in the mine. D. Atwood Knight of Lawson, Colorado, designer of industrial plants and smelters, is completing designs for a smelter at Hailey. *Paymaster Mine* at Arco is erecting a 200-ton mill, and ore is being stockpiled pending completion. This mine reports a recent lead strike of promise in its new tunnel. *Goldstone Mining Company* has bought a 150-ton flotation plant to be installed at its Salmon mine.

Also resuming operations because of the rise in metal prices is *Day Mines, Inc.*, which has re-opened its *Monitor* property north of Wallace, Idaho. The Carlisle mill which handles ore from the Monitor has begun running and brings to four the total mills the company has in operation. Five mines are operating.

In carrying out its joint-operating agreements, *Sunshine Mining Company* of Kellogg, Idaho, is working from its Jewell shaft on two different levels, the 3,850 level for *Silver Syndicate, Inc.*, and the 3,100 level for *Metropolitan Mines Corporation*. The work on the 3,850 level is to open Silver Syndicate's s-vein. The present deepest developed level in the Sunshine mine is the 3,700 level, and work on the 3,850 is being done from a station in the shaft sump from which a crosscut is being driven northerly about 300 feet to intersect Syndicate's vein in the west end of the Rambo area. Meanwhile mining is continuing from four stopes in the west end and one in the east end of the Rambo area and profits split for the two companies' accounts. The work on the 3,100 level for Metropolitan is a resumption of crosscutting towards the latter's vein system. The crosscut is progressing on a 1-shift basis and will have to be driven 1,200 to 1,400 feet, engineers believe, to reach the objective, the Big Creek fault. The vein lies on the footwall side of this major fault structure. The Metropolitan vein has been explored only to the 700-foot level, and very little ore was found at these relatively shallow depths.

The east drift on the No. 1 vein at *Nabob Silver-Lead Company's* mine, Kellogg, Idaho, has been driven 240 feet and has followed a 16-inch seam of lead-zinc ore for 40 feet, Veral Hammerand, company geologist, says. On each side of the drift diamond drilling has encountered stringers and the extent of these is being deter-

Montana Mine Prepares For Mining Season

The McLaren Gold Mines Company has mined gold-silver-copper ore continuously for the past 10 years from its property located about eight miles from Cooke City, Montana, at an elevation of about 10,000 feet. Mining can be done only during the summer months, so the company concentrates on extracting large tonnages at that time. As pictured above, ore is mined from a large surface deposit by wagon drills and a diesel shovel and is trucked to the mill stockpile at Cooke City by three 20-ton Euclid trucks. The mill runs all year and at present is treating about 150 tons of ore daily. Madden Nye is manager of the company and Henry Graves is mill superintendent.

8 Big Reasons

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HD-7 60.10 drawbar hp. Four speeds forward, to 5.00 m.p.h.; reverse to 1.89. Weight: 52" tread, 13,830 lbs.; 63" tread, 14,000 lbs. Available with large idler.

MODEL
HD-10 (shown here) 86.63 drawbar hp. Six speeds forward, to 6.03 m. p. h.; two reverse, to 4.15. Weight: 63" tread, 21,000 lbs.; 74" tread, 21,600 lbs. Available with large idler.

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mined by additional drilling. The east drift on the No. 6 vein also is being advanced.

A strike of lead-silver ore, three feet wide in some places, has been made in a raise from the 100-foot shaft level at the *Senator Stewart* mine being operated by *Silver Bowl, Inc.*, Kellogg, Idaho. The ore, which is predominantly lead, is the first to be mined from ground below the Fir tunnel where most of the mining has been done in the past. In another raise above the Fir tunnel, good ore is being mined and added to the company's stockpile which now holds about 3,000 tons.

More extensive development of *Coeur d'Alene Extension Mines, Inc.'s*, fluorspar deposits near Superior, Montana, appears likely if present negotiations are completed for *Superior Fluorspar Company* to take over development of some of the claims. The deal is on a stock and cash basis. Coeur d'Alene already has 18 claims leased to the *Riverside Copper Mining Company* of Kellogg, and this company resumed work last month after the winter shutdown. A lower tunnel is being extended about 30 feet further to reach one of two north-south veins which have been worked above. The second vein is about 185 feet west of the first. Riverside pays Coeur d'Alene a 10 percent royalty on shipments. Dr. F. E. Scott is president of the latter company, and Dr. T. R. Mason is president of Riverside.

The *Taylor-Knapp Company*, at Philipsburg, Montana, continues to treat 50 tons of manganese ore daily from its *Durango* and *True Fissure* mines, according to A. V. Taylor, general manager. This company produces battery grade concentrates.

Domestic Manganese and Development Company, Butte Montana, has resumed concentrating and roasting custom manganese ores. At present the ores are coming from the government stockpile built up during the war at Philipsburg. About 75 men are employed. John H. Cole, president and manager of the company, is in Washington, D. C., arranging further contracts for processing this metal.

C and L Construction Company of Pocatello, Idaho, is operating a new dredge at a site in Montana, 12 miles from Gibbonsville, Idaho. The company has dredging rights on 17,000 acres. Equipment includes a portable dredge on tracks designed by Mac Stickler, superintendent. The dredge has amalgam plates instead of riffles, is electrically operated, and uses a Northwest dragline. Other employees are Jerry Ownbey, Don Wakeley, and Marion Rainy.

American Smelting and Refining Company's subsidiary, the *Mike Horse Mining and Milling Company* has resumed production of lead and zinc at its property north of Helena, Montana, as a result of the higher prices for these metals. About 250 tons of lead and 175 tons of zinc will be produced monthly and 100 men will be on the staff.

Walter Richardson of Kennecott Copper Corporation has been examining the *Queen of Bronze* mine owned by *Waite Minerals Company* at Grants Pass, Oregon. The mine, a copper producer, has reportedly about 210,000 tons of average grade ore containing some gold values stockpiled until arrangements can be made to have it custom milled. Major E. R. Waite is president of the company.

At the *Standard* mine near Prairie City, Grant County, Oregon, Bert Hayes, operator, is making plans to sink a 50-foot shaft to explore the vein below the old workings. The mine contains values in copper, cobalt and gold.

The *Buffalo Dredging Company* is testing dredge ground on the Middle Fork of the John Day River, Grant County, Oregon. Last year the com-

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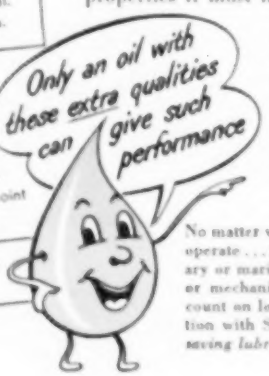

THE ABOVE is not just an isolated case. Other power companies, shipping companies, operators of all kinds of turbines testify to amazingly long, trouble-free lubrication from Shell Turbo Oil. And to significant savings in operating costs.

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pany operated its bucketline dredge at Mount Vernon.

In Baker County, Oregon, the *Golden Century Industries* has leased ground on Conner Creek, a tributary of the Snake River, and is testing its placer possibilities. The company also is sampling ground in the McNamee Gulch district, Greenhorn Mountains. Golden Century is an Idaho corporation.

The *Macy* mine, a gold property near Baker, Oregon, has been leased by William Rick, who is rehabilitating the surface buildings and some of the underground workings, and has sunk a 45-foot winze. Ore is being milled in a small Gibson mill.

WASHINGTON

The first 800-ton unit of *Pend Oreille Mines and Metals Company's* new mill at Metaline Falls, Washington, should be in operation by the first of September, according to President Lewis P. Larsen. The company's subsidiary, *Reeves-MacDonald Mines* which is just over the state line in British Columbia is gradually increasing production, and capacity output of 30,000 tons a month should be reached this month, he said.

The *Teller Mining Company* has been incorporated at Seattle, Washington, by E. W. Wardin, 609 Colman Building, A. G. Johnson, and several other men. The company is capitalized at $30,000.

A gold strike has been made near Port Angeles, Olympic peninsula, Washington, by Mrs. Grace Melick. She picked up samples of the ore on her farm at the foot of Mount Angeles. Since announcing her find, about forty prospecting applications have been filed at the state land commissioner's office.

Eagle Mountain Mining Company, Chewelah, Wash., is preparing for full operation of its three properties, the *Independence-Keystone*, the *United Copper*, and the *Amazon* mines, and will ship ore and concentrates to the Tacoma smelter. Mining machinery is being installed at the mines, a 150-ton mill is to be installed, and all three properties will be worked through the 4,200-foot United Copper tunnel which is being extended now to connect them. The United Copper mine is developed by two tunnels, one 680 feet long and one 4,200 feet long. Levels have been established every 100 feet to a depth of 1,400 feet. The Independence-Keystone is developed by two tunnels, also, to a depth of 300 feet. The Amazon has one tunnel and a 240-foot shaft. About 300,000 tons of ore is reported blocked out in the United Copper mine, of which 200,000 tons is below the 1,000-foot level.

Look at the difference in fragmentation

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Blasting with cap and fuse in the mine of the Sidney Mining Company at Kellogg, Idaho, gave results as shown in the photograph at the left, above. Large slabs and coarse pieces of ore required extensive hand labor and bulldozing before ore could be moved to chutes.

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Now ore breaks well. (See photo at right, above.) No secondary blasting is necessary, and the slusher handles ore easily. Other advantages of using Du Pont "MS" Delay Electric Blasting Caps are reduced vibration and concussion, less timber damage, elimination of dynamite from the muck pile and the absence of bootlegs.

Why not do as many experienced mine operators have done—switch to efficient Du Pont "MS" Delay Electric Blasting Caps? Any Du Pont Explosives representative will be glad to give you complete information about "MS" (Millisecond) Delay Electric Blasting Caps. He'll also work out a trial blasting plan for any problem you may have. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

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Booth 213-215, at the Metal Mining Convention and Exposition of The American Mining Congress, meeting in Salt Lake City, Utah, August 28 to September 1, 1950.

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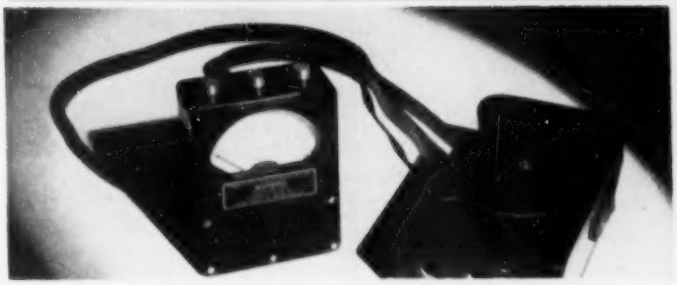
These are some of the new and notable features of the XLE: it requires a small foundation; "Pipeless, Thru-Frame Air Flow" means that air enters and leaves the compressor through main-air connections on the frame; the intercooler requires only one-fourth the space of conventional models; I-R channel valves have been engineered to the XLE.

High efficiency, assembled shipment, low-cost installation and relocation, and space economy are the advantages which Ingersoll-Rand Company claims for the XLE compressor. More information may be obtained by writing to MINING WORLD.

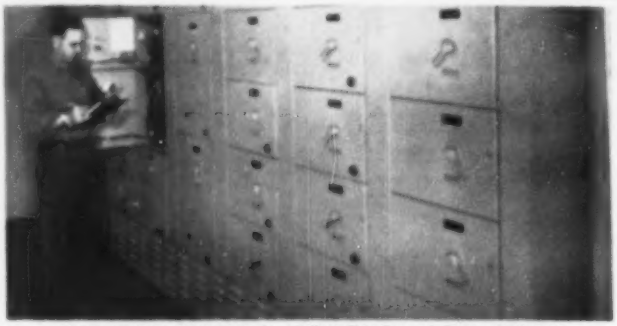


New blasting galvanometer manufactured by Atlas Powder Company.

Atlas Offers New Blasting Galvanometer

An adjustable blasting galvanometer, which gives accurate resistance readings in ohms even when its activating cell is not at full strength, is now being made available to blasters by Atlas Powder Company. Several exclusive features of the new instrument give extra safety and control in testing blasting circuits before firing.

Known as the Atlas No. 4 Blasting Galvanometer, the instrument is calibrated to an accuracy of less than one-half ohm resistance, making possible the checking of small resistances such as a single blasting cap. In addition, the new galvanometer may be used as an ammeter in the detection of stray currents, a function especially useful in underground blasting work, affording an extra measure of protection before hooking up the circuit.



G-E ORE-MIXING CONTROL FOR SELBY

An almost completely automatic system of moving and mixing gold, silver and lead ore has been installed at A. S. & R. Co.'s smelter at Selby, California. The new central system replaces a system of individual controls, mounted in various points throughout the plant. Eight remote push-button stations, each controlling a sequence of operations, are connected to the main G-E control center; the result is that each of the two control centers is a master control for the interlocked system of conveyors, elevators, crushing rolls, feeders, and vibrators. The new system provides centralized control of the rate of feed, and at the same time allows for proportioned blending of the ore.

Penn Crusher Acquires Dixie Machinery Company

The Dixie Machinery Mfg. Co., St. Louis, manufacturers of crushing and pulverizing equipment, has announced the purchase of all of its capital stock by the Pennsylvania Crusher Company, Philadelphia, Pennsylvania, a division of the Bath Iron Works Corporation.

According to Elmer W. Noxon, former president of the Dixie organization and now its acting manager, Dixie products will have behind them not only the present Dixie staff and facilities, but the engineering, field experience and organization of the Pennsylvania Crusher Company, supported by the management and manufacturing strength of the Bath Iron Works Corporation.

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Cummins Improves Sales And Service Facilities

The Cummins Diesel Sales Corporation has announced a change in the location of Cummins service facilities in Seattle, together with a change in ownership of their sales and service facilities in both Seattle and Spokane. The new Seattle address is 1520 Fourth Avenue South, at which place all of the sales and service functions of Cummins will be handled for Western Washington and Alaska. A shop is being set up to handle all service requirements for truck, industrial and marine types of Cummins engines. A complete stock of genuine Cummins parts and engines will be maintained at that address.

Customers in the Spokane area may obtain their parts and service from Cummins Diesel Sales Corporation at South 155 Sherman Street, which has been the location for Cummins service for some years. Kenney's Cummins Diesel Service at 418 West Wishkah, Aberdeen, will continue to serve Cummins users in the Harbor area. Sales and service personnel of the previous Cummins dealerships will be available to Cummins users through the new organization. William L. (Bill) Wheeler will act as service manager at Seattle and John Peters will continue as service manager at Spokane. H. M. Dagg and W. J. (Bill) McClure will continue as sales representatives, working from the Seattle office, while Wesley Stout contacts the trade out of Spokane.

The Cummins Diesel Sales Corporation is a wholly owned subsidiary of the Cummins Engine Co., Inc., manufacturers of a complete line of high-speed diesels for the trucking, logging, construction, and marine fields.

Its entry into distribution and service in Washington and Alaska resulted when David J. Buttles, proprietor of Cummins Northwest Diesel Sales, and distributor since 1935, elected to retire from the business. The Cummins Engine Company's sales subsidiary, established some years ago, has trained personnel and organization for handling situations of this nature, to provide continuity of service to Cummins users.

Elaborate plans have been made to improve sales and service facilities for Cummins products throughout the Northwest area. A complete new special purpose shop and service building is in the planning stage for Seattle, and it is hoped that it will be erected within the next six months. Plans are also being made to extend complete Cummins service to Alaska as soon as the necessary arrangements can be made.

Hardinge Adds Lime Equipment to Line

Hardinge Company, Incorporated, York, Pennsylvania, has signed a contract with Ellicott Machine Corporation of Baltimore, giving the Hardinge organization exclusive manufacturing and sales rights for Kuntz lime and hydrate equipment.

The two major pieces of equipment which will be built and sold by Hardinge under this contract are the Kuntz Continuous Feed Automatic Type Lime Kiln and the Kuntz Lime Hydrator.

The contract also makes Hardinge Company, Inc., exclusive suppliers of repair parts for the Clyde and Schulthess Hydrators, as well as the Sobek Kiln.

Catalogs covering the Kuntz Hydrator and Kuntz Kiln are now being prepared and will be issued in the near future.

Flexible Rubber Pipe Bulletin Issued

The Hewitt Rubber Division, Hewitt-Robins Inc., has just issued an eight-page bulletin explaining the applications and comparative qualities of Flexible Rubber Pipe as against metal pipe in many services, exclusive of long lines. Economies in costs of installation and maintenance as well as longer life are explored in detail. A progressive picture story, occupying two pages, shows the greater use of installation claimed for the rubber product. Case histories and recommended applications tend to verify the arguments in favor of its selection. Copies of Bulletin No. H-1 are available to readers by writing to MINING WORLD, 121 Second St., San Francisco, Calif.

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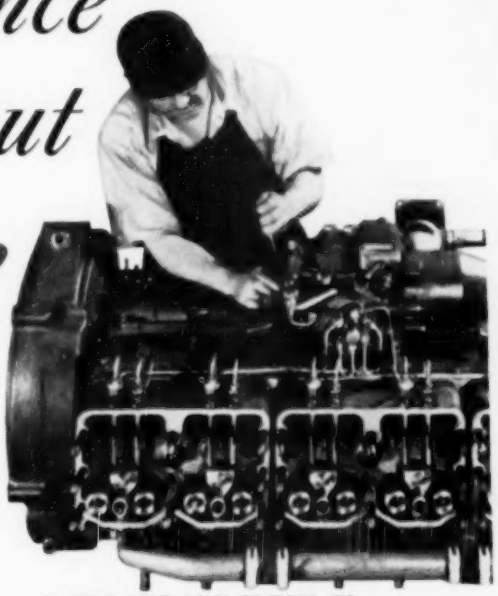

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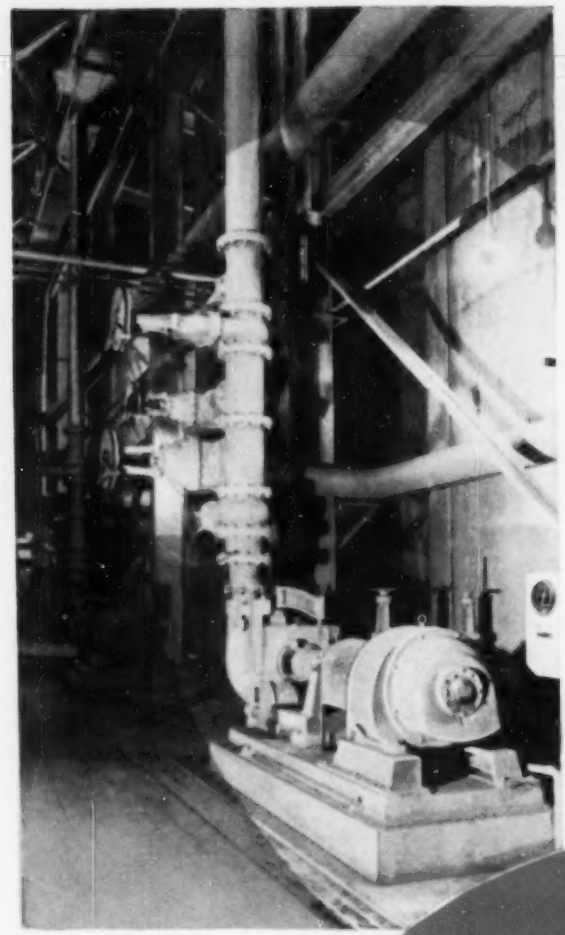

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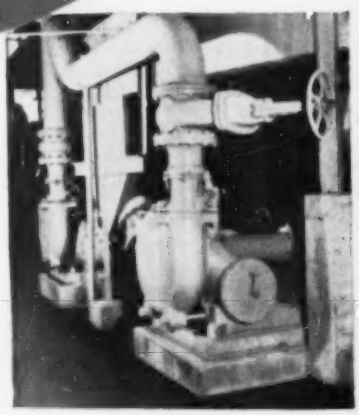

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